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16 ACTIVITY FACTORS

16.1 INTRODUCTION

As a consequence of a child's immaturity and small stature, certain activities and behaviors specific to children place them at higher risk to certain environmental agents (Chance and Harmsen, 1998). Individual or group activities are important determinants of potential exposure, because toxic chemicals introduced into the environment may not cause harm to a child until an activity is performed that subjects the child to contact with those contaminants. An activity or time spent in a given activity will vary among children on the basis of, for example, culture, ethnicity, hobbies, location, gender, age, socioeconomic characteristics, and personal preferences. However, limited information is available regarding ethnic, cultural and socioeconomic differences in children's choice of activities or time spent in a given activity.

It is difficult to accurately collect/record data for a child's activity patterns (Hubal et al., 2000). Children engage in more contact activities than adults; therefore, a much wider distribution of activities need to be considered when assessing children's exposure (Hubal et al., 2000). Behavioral patterns, preferred activities, and developmental stages result in different exposures for children than for adults (Chance and Harmsen, 1998). Other factors that may affect children's activity patterns include: social status, economics, and the cultural practices of their families.

This chapter summarizes data on how much time children spend participating in various activities in various microenvironments. Information on the frequency of performing various activities is also provided. The data in this chapter cover a wide range of activities and populations, arranged by age group when such data are available. One of the objectives of this handbook is to provide recommended exposure factor values using a consistent set of age groups. In this chapter, several studies are used as sources for activity pattern data. In some cases, the source data could be retrieved and analyzed using the standard age groupings recommended in *Guidance for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005). In other cases, the original source data were not available, and the study results are presented here using the same age groups as the original study, whether or not they conform to the standard age groupings.

The recommendations for activity factors are provided in the next section, along with a summary of the confidence ratings for these recommendations. The recommended values are based on key studies identified by U.S. EPA for this factor. Following the recommendations, key studies on activity patterns are summarized. Relevant data on activity patterns are also presented to provide the reader with added perspective on the current state-of-knowledge pertaining to activity patterns in children.

16.2 RECOMMENDATIONS

Assessors are commonly interested in quantitative information describing several types of time use data for children including: time spent indoors and outdoors; time spent bathing, showering, and swimming; and time spent playing on various types of surfaces. The recommended values for these factors are summarized in Table 16-1. Note that, except for swimming, all activity factors are reported in units of minutes/day. Time spent swimming is reported in units of minutes/month. These data are based on two key studies presented in this chapter: a study of children's activity patterns in California (Wiley et al., 1991) and the National Human Activity Pattern Survey (NHAPS) (U.S. EPA, 1996). Both mean and 95th percentile recommended values are provided. However, because these recommendations are based on short-term survey data, 95th percentile values may be misleading for estimating chronic (i.e., long term) exposures and should be used with caution. Also, the upper percentile values for some activities are truncated as a result of the maximum response included in the survey (e.g., durations of more than 120 minutes/day were reported as 121 minutes/day), and could not be further refined). The confidence ratings for the recommendations are presented in Table 16-2.

The recommendations for total time spent indoors and the total time spent outdoors are based on U.S. EPA re-analysis of the source data from Wiley et al. (1991) for children < 1 year of age and U.S. EPA (1996) for age groups > 1 year of age. Although Wiley et al. (1991) is a study of California children and the sample size was very small for infants, it provides data for children's activities for the younger age groups.

Data from U.S. EPA (1996) are representative of the U.S. general population. In some cases, however, the time spent indoors or outdoors would be better addressed on a site-specific basis since the times are likely to vary depending on the climate, residential setting (i.e., rural versus urban), personal traits (e.g., health status) and personal habits. The recommended values for time spent indoors at a residence, duration of showering and bathing, and time spent swimming are based on a U.S. EPA re-analysis of the source data from U.S. EPA (1996). Likewise, the recommended values for time spent playing on sand, gravel, grass or dirt are based on a U.S. EPA re-analysis of the source data from U.S. EPA (1996).

Table 16-1. Recommended Values for Activity Factors

Age Group	Mean	95th Percentile	Source
		Time Indoors (total) minutes/day	
Birth to <1 month	1,440	-	U.S. EPA analysis of source data from Wiley et al., 1991 for age groups from birth to < 12 months. Average for boys and girls. See Table 16-10. U.S. EPA re-analysis of source data from U.S. EPA, 1996 for age groups from 1 to < 21 years. See Table 16-14.
1 to <3 months	1,432	-	
3 to <6 months	1,414	-	
6 to <12 months	1,301	-	
1 to <2 years	1,353	-	
2 to <3 years	1,316	-	
3 to <6 years	1,278	-	
6 to <11 years	1,244	-	
11 to <16 years	1,260	-	
16 to <21 years	1,248	-	
		Time Outdoors (total) minutes/day	
Birth to <1 month	0	-	U.S. EPA analysis of source data from Wiley et al., 1991 for age groups from birth to < 12 months. Average for boys and girls. See Table 16-10. U.S. EPA re-analysis of source data from U.S. EPA, 1996 for age groups from 1 to < 21 years. See Table 16-14.
1 to <3 months	8	-	
3 to <6 months	26	-	
6 to <12 months	139	-	
1 to <2 years	36	-	
2 to <3 years	76	-	
3 to <6 years	107	-	
6 to <11 years	132	-	
11 to <16 years	100	-	
16 to <21 years	102	-	
		Time Indoors (at residence) minutes/day	
Birth to <1year	1,108	1,440	U.S. EPA re-analysis of source data from U.S. EPA, 1996. Doers only. See Table 16-11.
1 to <2 years	1,065	1,440	
2 to <3 years	979	1,296	
3 to <6 years	957	1,355	
6 to <11 years	893	1,275	
11 to <16 years	889	1,315	
16 to <21 years	833	1,288	
		Showering minutes/day	
Birth to <1year	15	-	U.S. EPA re-analysis of source data from U.S. EPA, 1996. Doers only. See Table 16-18.
1 to <2 years	20	-	
2 to <3 years	22	44	
3 to <6 years	17	34	
6 to <11 years	18	41	
11 to <16 years	18	40	
16 to <21 years	20	45	

Table 16-1. Recommended Values for Activity Factors (continued)			
Age Group	Mean	95th Percentile	Source
		Bathing minutes/day	
Birth to <1 year	19	30	U.S. EPA re-analysis of source data from U.S. EPA, 1996. Doers only. See Table 16-18.
1 to <2 years	23	32	
2 to <3 years	23	45	
3 to <6 years	24	60	
6 to <11 years	24	46	
11 to <16 years	25	43	
16 to <21 years	33	60	
		Swimming minutes/month	
Birth to <1 year	96	-	U.S. EPA re-analysis of source data from U.S. EPA, 1996. Doers only. See Table 16-21.
1 to < 2 years	105	-	
2 to <3 years	116	181	
3 to <6 years	137	181	
6 to <11 years	151	181	
11 to <16 years	139	181	
16 to <21 years	145	181	
		Playing on Sand/Gravel minutes/day	
Birth to <1 year	18	-	U.S. EPA re-analysis of source data from U.S. EPA, 1996. Doers only. See Table 16-22.
1 to < 2 years	43	121	
2 to <3 years	53	121	
3 to <6 years	60	121	
6 to <11 years	67	121	
11 to <16 years	67	121	
16 to <21 years	83	-	
		Playing on Grass minutes/day	
Birth to <1 year	52	-	U.S. EPA re-analysis of source data from U.S. EPA, 1996. Doers only. See Table 16-22.
1 to < 2 years	68	121	
2 to <3 years	62	121	
3 to <6 years	79	121	
6 to <11 years	73	121	
11 to <16 years	75	121	
16 to <21 years	60	-	

Table 16-1. Recommended Values for Activity Factors (continued)

Age Group	Mean	95th Percentile	Source
		Playing on Dirt minutes/day	
Birth to <1 year	33	-	U.S. EPA re-analysis of source data from U.S. EPA, 1996. Doers only. See Table 16-22.
1 to < 2 years	56	121	
2 to <3 years	47	121	
3 to <6 years	63	121	
6 to <11 years	63	121	
11 to <16 years	49	120	
16 to <21 years	30	-	

- Percentiles were not calculated for sample sizes less than 10.

Note: All activities are reported in units of minutes/day, except swimming, which is reported in units of minutes/month. There are 1,440 minutes in a day. Time indoors and outdoors may not add up to 1,440 minutes due to activities that could not be classified as either indoors or outdoors.

Table 16-2. Confidence in Recommendations for Activity Factors

General Assessment Factors	Rationale	Rating
Soundness		High
Adequacy of Approach	The survey methodologies and data analyses were adequate. In the U.S. EPA (1996) study, responses were weighted according to this demographic data. The California children's activity pattern survey design (Wiley et al., 1991) and NHAPS (U.S. EPA, 1996) consisted of large overall sample sizes that varied with age. Data were collected via questionnaires and interviews.	
Minimal (or Defined) Bias	Measurement or recording error may have occurred since the diaries were based on 24 hour recall. The sample sizes for some age groups were small for some activity factors. The upper ends of the distributions were truncated for some factors. The data were based on short-term data.	
Applicability and Utility		Medium
Exposure Factor of Interest	The key studies focused on activities of children.	
Representativeness	U.S. EPA (1996) was a nationally representative survey of the U.S. population; the Wiley et al. (1991) survey was conducted in California and it was not representative of the U.S. population.	
Currency	The Wiley et al. (1991) study was conducted between April 1989 and February 1990; the U.S. EPA (1996) study was conducted between October 1992 and September 1994.	
Data Collection Period	Data were collected for a 24-hour period.	
Clarity and Completeness		Medium
Accessibility	The original studies are widely available to the public; U.S. EPA analysis of the original raw data from U.S. EPA (1996) is available upon request.	
Reproducibility	The methodologies were clearly presented; enough information was included to reproduce the results.	
Quality Assurance	Quality assurance methods were not well described in study reports.	
Variability and Uncertainty		Medium
Variability in Population	Variability was characterized across various age categories of children.	
Uncertainty	The studies were based on short term recall data, and the upper ends of the distributions were truncated.	
Evaluation and Review		Medium
Peer Review	The original studies received a high level of peer review. The re-analysis of the U.S. EPA (1996) data to conform to the standardized age categories was not peer-reviewed.	
Number and Agreement of Studies	There were 2 key studies.	
Overall Rating		**Medium for the mean; low for upper percentile**

16.3 ACTIVITY PATTERNS

This section briefly describes published time-use studies that provide information on time-activity patterns of children in the U.S. For a detailed description of the studies, the reader is referred to the Exposure Factors Handbook (U.S. EPA, 1997).

16.3.1 KEY STUDIES

16.3.1.1 *Wiley et al., 1991 - Study of Children's Activity Patterns*

The California Study of Children's Activity Patterns survey (Wiley et al., 1991) provided estimates of the time children spent in various activities and locations (microenvironments) on a typical day. The sample population consisted of 1,200 children, under 12 years of age, selected from English-speaking households using Random Digit Dial (RDD) methods. This represented a survey response rate of 77.9 percent. One child was selected from each household. If the selected child was 8 years old or less, the adult in the household who spent the most time with the child responded. However, if the selected child was between 9 and 11 years old, that child responded. The population was also stratified to provide representative estimates for major regions of the state. The survey questionnaire included a time diary which provided information on the children's activity and location patterns based on a 24-hour recall period. In addition, the survey questionnaire included questions about potential exposure to sources of indoor air pollution (e.g., presence of smokers) on the diary day, and the socio-demographic characteristics of children and adult respondents. The questionnaires and the time diaries were administered via a computer-assisted telephone interviewing (CATI) technology (Wiley et al., 1991). The telephone interviews were conducted during April 1989 to February 1990 over four seasons: spring (April to June 1989), summer (July to September 1989), fall (October to December 1989), and winter (January to February 1990).

The data obtained from the survey interviews resulted in ten major activity categories, 113 detailed activity codes, 6 major categories of locations, and 63 detailed location codes. The time respondents under 12 years of age spent in the 10 activity categories (plus a "don't know" or non-coded activity category) are presented in Table 6-3. For each of the 10 activity categories, this table presents the mean duration for all survey participants, the percentage of respondents who reported participating in the activity (i.e., percent doers), and the mean, median, and maximum duration for only those survey respondents who engaged in the activity (i.e., doers). It also includes the detailed activity with the highest mean duration of time for each activity category. The activity category with the highest time expenditure was personal needs and care, with a mean of 794 minutes/day (13.2 hours/day). Night sleep was the detailed activity that had the highest mean duration in that activity category. The activity category "don't know" had a mean duration of about 2 minutes/day and only 4 percent of the respondents reported missing activity time.

Table 16-4 presents the mean time spent in the 10 activity categories by age and gender. Because the original source data were available, U.S. EPA re-analyzed the data according to the standardized age categories used in this handbook. Differences between activity patterns in boys and girls tended to be small. Table 16-5 presents the mean time spent in the 10 activity categories grouped by season and geographic region in the state of California. There were seasonal differences for 5 activity categories: personal needs and care, education, entertainment/social, recreation, and communication/passive leisure. Time expenditure differences in various regions of the state were minimal for childcare, work-related, goods/services, personal needs and care, education, entertainment/social, and recreation.

Table 16-6 presents the distribution of time across six location categories. The mean duration for all survey participants, the percent of respondents engaging in the activity (i.e., percent doers); the mean, median, and maximum duration for doers only; and the detailed locations with the highest average time expenditure are shown. For all survey respondents, the largest mean amount of time spent was at home (1,078 minutes/day); 99 percent of respondents spent time at home (mean of 1,086 minutes/day for these individuals only). Tables 16-7 and 16-8 show the average time spent in the six locations grouped by age and gender, and season and region, respectively. Again, because the original source data were available, the age categories used by Wiley et al. (1991) have been replaced in Table 16-7 by the standardized age categories used in this

handbook. There were relatively large differences among the age groups in time expenditure for educational settings (Table 16-7). There were small differences in time expenditure at the six locations by region, but time spent in school decreased in the summer months compared to other seasons (Table 16-8).

Table 16-9 shows the average time children spent in proximity to gasoline fumes and gas oven fumes. In general, the sampled children spent more time closer to gasoline fumes than to gas oven fumes. The age categories in Table 16-9 have been modified to conform to the standardized categories used in this handbook.

The U.S. EPA estimated the total time indoors and outdoors using the data from the Wiley et al. (1991) study. Activities performed indoors were assumed to include household work, child care, personal needs and care, education, and communication/passive leisure. The average times spent in these indoor activities and half the time spent in each activity which could have occurred either indoors or outdoors (i.e., work-related, goods/services, organizational activities, entertainment/social, don't know/not coded) were summed. Table 16-10 summarizes the results of this analysis using the standard age groups.

A limitation of this study is that the sampling population was restricted to only English-speaking households; therefore, the data obtained do not represent the diverse population group present in California. Another limitation is that time use values obtained from this survey were based on short-term recall (24-hr) data; therefore, the data set obtained may be biased. Other limitations are: the survey was conducted in California and is not representative of the national population, and the significance of the observed differences in the data obtained (i.e., gender, age, seasons, and regions) were not tested statistically. An advantage of this study is that time expenditure in various activities and locations were presented for children grouped by age, gender, and season. Also, potential exposures of respondents to pollutants were explored in the survey. Another advantage is the use of the CATI program in obtaining time diaries, which allows automatic coding of activities and locations onto a computer tape, and allows activities forgotten by respondents to be inserted into their appropriate position during interviewing.

16.3.1.2 *U.S. EPA, 1996 - National Human Activity Pattern Survey (NHAPS)*

U.S. EPA (1996) analyzed data collected by the National Human Activity Pattern Survey (NHAPS). This survey was conducted by U.S. EPA and is the largest and most current human activity pattern survey available (U.S. EPA, 1996). Data for 9,386 respondents in the 48 contiguous United States were collected via minute-by-minute 24-hour diaries. NHAPS was conducted from October 1992 through September 1994 by the University of Maryland's Survey Research Center using CATI technology to collect 24-hour retrospective diaries and answers to a number of personal and exposure related questions from each respondent. Detailed data were collected for a maximum of 82 different possible locations, and a maximum of 91 different activities. Participants were selected using a RDD method. The response rate was 63 percent, overall. If the chosen respondent was a child too young to interview, an adult in the household gave a proxy interview. Each participant was asked to recount their entire daily routine from midnight to midnight immediately previous to the day that they were interviewed. The survey collected information on duration and frequency of selected activities and of the time spent in selected microenvironments. In addition, demographic information was collected for each respondent to allow for statistical summaries to be generated according to specific subgroups of the U.S. population (i.e., by gender, age, race, employment status, census region, season, etc.). The participants' responses were weighted according to geographic, socioeconomic, time/season, and other demographic factors to ensure that results were representative of the U.S. population. The weighted sample matched the 1990 U.S. census population for each gender, age group, census region, and the day-of-week and seasonal responses were equally distributed. Saturdays and Sundays were over sampled to ensure an adequate weekend sample.

Tables 16-11 through 16-24 provide data from the NHAPS study. In most cases, the source data from U.S. EPA have been reviewed and re-analyzed by U.S. EPA to conform to the age categories

recommended in *Guidance for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005) and used in this handbook. Because no data were available on subjects' age in months, age groups less than 1 year old were consolidated into a single group. These tables provide statistics for 24-hour cumulative time spent (mean, minimum, percentiles, and maximum) in selected locations or engaging in selected activities. For each location or activity, statistics were calculated for the entire survey population (i.e., whole population) and for the subset of the survey population that reported being in the location or doing the activity in question (i.e., doers only). When the sample size was 10 persons or fewer, percentile values were not calculated. Also note that some of these activities were not necessarily mutually exclusive (e.g. time spent in active sports likely overlaps with exercise time).

Table 16-11 presents data for the time children spent in various rooms of the house (i.e., kitchen, living room, dining room, bathroom, bedroom, and garage), and all rooms combined. Table 16-12 presents data for time spent in other indoor locations (i.e., restaurants, indoors at school, and grocery/convenience stores). Table 16-13 presents data for the time children spent outdoors on school grounds/playgrounds, parks or golf courses, or pool rivers, or lakes. Table 16-14 provides data on time spent in indoor and outdoor environments. The U.S. EPA estimated the time spent indoors by adding the average times spent indoors at the respondents' home (kitchen, living room, bathroom, etc.), at other houses, and inside other locations such as school, restaurants, etc. Time outdoors was estimated by adding the average time spent outdoors at the respondents' pool and yard, others' pool and yard, and outside other locations such as sidewalk, street, neighborhood, parking lot, service station/gas station, school grounds, park/golf course, pool, river, lake, farm, etc. Table 16-15 presents data for the time spent in various types of vehicles (i.e., car, truck/van, bus), and in all vehicles combined. Table 16-16 presents data for the time children spent in various major activity categories (i.e., sleeping, napping, eating, attending school, outdoor recreation, active sports, exercise, and walking).

Table 16-17 through 16-19 provide data related to showering, bathing, and handwashing activities. Tables 16-20 and 16-21 provide data on monthly swimming (in a freshwater pool) frequency by the number of respondents and swimming duration, respectively. Table 16-22 provides data on the time children spent playing on dirt, sand/gravel, or grass, and Table 16-23 provides data on the number of minutes spent near excessive dust. Table 16-24 provides information on time spent in the presence of smokers. For this data set, the authors' original age categories were used because the methodology used to generate the data could not be reproduced.

The advantages of the NHAPS data set are that it is representative of the U.S. population and it has been adjusted to be balanced geographically, seasonally, and for day/time. Also, it is inclusive of all ages, genders, and races. A disadvantage of the study is that for the standard age categories, the number of respondents is small for the "doers" of many activities. In addition, the durations exceeding 60, 120, and 181 minutes were not collected for some activities. Therefore, the actual time spent at the high end of the distribution for these activities could not be accurately estimated.

16.3.2 RELEVANT STUDIES

16.3.2.1 *Timmer et al., 1985 - How Children Use Time*

Timmer et al. (1985) conducted a study using the data obtained on children's time use from a 1981-1982 panel study. Data were obtained for 389 children between 3 and 17 years of age. Data were collected using a time diary and a standardized interview. The time diary involved children reporting their activities beginning at 12:00 a.m. the previous night, the duration and location of each activity, the presence of another individual, and whether they were performing other activities at the same time. The standardized interview was administered to the children to gather information about their psychological, intellectual (using reading comprehension tests), and emotional well-being; their hopes and goals; their family environment; and their attitudes and beliefs.

For preschool children, parents provided information about the child's previous day's activities. Children in first through third grades completed the time diary with their parents assistance and, in addition, completed reading tests. Children in fourth grade and

above provided their own diary information and participated in the interview. Parents were asked to assess their children's socioemotional and intellectual development, and a survey form was sent to a teacher of each school-age child to evaluate their socioemotional and intellectual development. The activity descriptor codes used in this study were developed by Juster et al. (1983).

The mean time spent performing major activities on weekdays and weekends by age, sex, and type of day is presented in Table 16-25. On weekdays, children spend about 40 percent of their time sleeping, 20 percent in school, and 10 percent eating, and performing personal care activities (Timmer et al., 1985). The data in Table 16-25 indicate that girls spent more time than boys performing household work and personal care activities and less time playing sports. Also, the children spent most of their free time watching television.

Table 16-26 presents the mean time children spent during weekdays and weekends performing major activities by five different age groups. The significant effects of each variable (i.e., age and sex) are also shown. Older children spent more time performing household and market work, studying, and watching television and less time eating, sleeping, and playing. The authors estimated that, on average, boys spent 19.4 hours a week and girls spent 17.8 hours per week watching television.

U.S. EPA estimated the total time indoors and outdoors using the Timmer et al. (1985) data. Activities performed indoors were assumed to include household work, personal care, eating, sleeping, attending school, studying, attending church, watching television, and engaging in household conversations. The average times spent in these indoor activities and half the time spent in each activity which could have occurred indoors or outdoors (e.g., market work, sports, hobbies, art activities, playing, reading, and other passive leisure) were summed. Table 16-27 summarizes the results of this analysis by age group and time of the week.

A limitation associated with this study is that it was conducted in 1981. It is likely that activity patterns of children have changed from 1981 to the present. Thus, the application of these data to current exposure assessments may bias their results. Another limitation is that the data do not provide overall annual estimates of children's time use since data were collected only during the time of the year when children attended school and not during school vacations. An advantage of this survey is that diary recordings of activity patterns were kept and the data obtained were not based entirely on recall. Another advantage is that because parents assisted younger children with keeping their diaries and with interviews, any bias that may have been created by having younger children record their data should have been minimized.

16.3.2.2 *Robinson and Thomas, 1991 - Time Spent in Activities, Locations, and Microenvironments: A California-National Comparison*

Robinson and Thomas (1991) reviewed and compared data from the 1987-88 California Air Resources Board (CARB) time-activity study for California residents and from a similar 1985 national study, *Americans' Use of Time*, conducted at the University of Maryland. Both studies used the diary approach to collect data. Time- use patterns were collected for individuals aged 12 years and older. Telephone interviews based on the RDD procedure were conducted for 1,762 and 2,762 respondents for the CARB study and the national study, respectively. Of these respondents, 183 were children, ages 12 to17 years in the CARB study and 340 were children, ages 12 to 17 years, in the national study. Robinson and Thomas (1991) defined a set of 16 microenvironments based on the activity and location codes employed in the two studies. The mean durations of time spent in the 16 microenvironments by children, ages 12 to 17 years, are presented in Table 16-28. In both studies, children spent the majority of their time sleeping, and engaging in leisure and work/study-related activities.

The limitations associated with the Robinson and Thomas (1991) study are that the CARB survey was performed in California only and may not be representative of the U.S. population as a whole. In addition, the studies were conducted in the 1980s and activity patterns may have changed over time. Another limitation is that the data are based on short-term studies. Finally, the available data could not be re-analyzed to conform to the standardized age categories used in this handbook.

16.3.2.3 *Funk et al., 1998 - Quantifying the Distribution of Inhalation Exposure in Human Populations: Distribution of Time Spent by Adults, Adolescents, and Children at Home, at Work, and at School*

Funk et al. (1998) used the data from the CARB study to determine distributions of exposure time by tracking the time spent participating in daily at-home and at-school activities for male and female children and adolescents. CARB performed two studies from 1987 to 1990; the first was focused on adults (18 years and older) and adolescents (12-17 years old), and the second focused on children (6-11 years old). The targeted groups were noninstitutionalized English speaking Californians with telephones in their residences. Individuals were contacted by telephone and asked to account for every minute within the previous 24 hours, including the amount of time spent on an activity and the location of the activity. The surveys were conducted on different days of the week as well as different seasons of the year.

Using the location descriptors provided in the CARB study, Funk et al. (1998) categorized the activities into two groups, "at home" (any activity at principal residence) and "away." Each activity was assigned to one of three inhalation rate levels (low, moderate, or high) based on the level of exertion expected from the activity. Ambiguous activities were assigned to moderate inhalation rate levels. Among the adolescents and children studied, means were determined for the aggregate age groups, as shown in Table 16-29.

Funk et al. (1998) used several statistical methods, such as Chi-square, Kolmogorov-Smirnov, and Anderson-Darling, to determine whether the time spent in an activity group had a known distribution. Most of the activities performed by children were assigned a low or moderate inhalation rate rate (Table 16-30).

The aggregate time periods spent at home in each activity are shown in Table 16-31. Aggregate time spent at home performing different activities was compared between genders. There were no significant differences between adolescent males and females in any of the activity groups (Table 16-32). In children, ages 6-11 years, differences between gender and age were observed at the low inhalation rate levels. There were significant differences between two age groups (6-8 years, and 9-11 years) and gender at the moderate inhalation rate level (Table 16-33).

A limitation of this study was that large proportions of the respondents in the study did not participate in high-inhalation rate-level activities. The Funk et al. (1998) study was based on data from one geographic location, collected more that a decade ago. Thus, it may not be representative of current activities among the general population of the U.S.

16.3.2.4 *U.S. EPA, 2000 - Consolidated Human Activity Database (CHAD)*

The Consolidated Human Activity Database (CHAD), available online at http://www.epa.gov/chadnet1/, was developed by the U.S. EPA's National Exposure Research Laboratory (NERL) to provide access to existing human activity data for use in exposure and risk assessment efforts. Data from twelve activity pattern studies conducted at the city, state, and national levels are included in CHAD. CHAD contains both the original raw data from each study and data modified based on predefined format requirements. Modifications made to data included: recoding of variables to fit into them a common activity/location code system, and standardization of time diaries to an exact 24-hour length. Detailed information on the coding system and the studies included in CHAD is available in the CHAD User Manual, available at http://oaspub.epa.gov/chad/CHAD_Datafiles$.startup#Manual, and in McCurdy et al. (2000).

A total of 144 activity codes and 115 location codes were used in CHAD (McCurdy et al., 2000). Although some participants in a study conducted multiple activities, many activities were only conducted within a few studies. The same is true for activity locations. The selection of exposure estimates for a particular activity or particular location should be based on study parameters that closely relate to the exposure scenario being assessed. The maximum amount of time, on average, within a majority of the studies was sleeping or taking a nap, while the maximum amount of time spent at a particular location was at home or at work, depending on the study.

Many of the limitations of CHAD data arise from the incorporation of multiple studies into the time

diary functions specified in CHAD. Activities and locations were coded similarly to the NHAPS study; studies with differing coding systems were modified to fit the NHAPS codes. In some cases start times and end times from a study had to be adjusted to fit a 24-hour period. Respondents were not randomly distributed in CHAD. For example, some cities or states were over sampled because entire studies were carried out in those places. Other studies excluded large groups of people such as smokers, or non-English speakers, or people without telephones. Many surveys were age-restricted, or they preferentially sampled certain target groups. As a result, users are cautioned against using random individuals in CHAD to represent the U.S. population as a whole (Glenn et al., 2000).

16.3.2.5 *Hubal et al., 2000 - Children's Exposure Assessment: A Review of Factors Influencing Children's Exposure and the Date Available to Characterize and Assess that Exposure*

Hubal et al. (2000) reviewed available data from CHAD, including activity pattern data, to characterize and assess environmental exposures to children. CHAD contains 3,009 person-days of macroactivity data for 2,640 children less than 12 years of age (Hubal et al., 2000) (Table 16-34). The number of hours these children spent in various microenvironments are shown in Table 16-35 and the time they spent in various activities indoors at home is shown in Table 16-36.

Hubal et al. (2000) noted that CHAD contains approximately "140 activity codes and 110 location codes, but the data generally are not available for all activity locations for any single respondent. In fact, not all of the codes were used for most of the studies. Even though many codes are used in macroactivity studies, many of the activity codes do not adequately capture the richness of what children actually do. They are much too broadly defined and ignore many child-oriented behaviors. Thus, there is a need for more and better-focused research into children's activities."

U.S. EPA updated the analysis performed by Hubal et al. (2000) using CHAD data downloaded in 2000, sorted according to the age groups recommended in *Guidance for Monitoring and Assessing Childhood Exposures to Environmental Contaminants* (U.S. EPA, 2005). The results are shown in Tables 16-37 and 16-38. In this analysis, individual study participants within CHAD whose behavior patterns were measured over multiple days were treated as multiple one-day activity patterns. This is a potential source of error or bias in the results because a single individual may contribute multiple data sets to the aggregate population being studied.

16.3.2.6 *Wong et al., 2000 - Adult Proxy Responses to a Survey of Children's Dermal Soil Contact Activities*

Wong et al. (2000) conducted telephone surveys to gather information on children's activity patterns as related to dermal contact with soil during outdoor play on bare dirt or mixed grass and dirt surfaces. This study, the second Soil Contact Survey (SCS-II), was a follow-up to the initial Soil Contact Survey (SCS-I), conducted in 1996, that primarily focused on assessing adult behavior related to dermal contact with soil and dust (Garlock et al., 1999). As part of SCS-I, information was gathered on the behavior of children under the age of 18 years, however, the questions were limited to clothing choices and the length of time between soil contact and hand washing. Questions were posed for SCS-II to further define children's outdoor activities and hand washing and bathing frequency. For both soil contact surveys households were randomly phoned in order to obtain nationally representative results. The adult respondents were questioned as surrogates for one randomly chosen child under the age of 18 residing within the household.

In the SCS-II, of 680 total adult respondents with a child in their household, 500 (73.5 percent) reported that their child played outdoors on bare dirt or mixed grass and dirt surfaces (identified as "players"). Those children that reportedly did not play outdoors ("non-players") were typically very young ($\leq$1 year) or relatively older ($\geq$14 years). Of the 500 children that played outdoors, 497 played outdoors in warm weather months (April through October) and 390 were reported to play outdoors during cold weather months (November through March). These results are presented in Table 16-39. The frequency (days/week), duration (hours/day), and total hours per week spent playing outdoors was determined for those children

identified as "players" (Table 16-40). The responses indicated that children spent a relatively high percentage of time outdoors during the warmer months, and a lesser amount of time outdoors in cold weather. The median play frequency reported was 7 days/week in warm weather and 3 days/week in cold weather. Median play duration was 3 hours/day in warm weather and 1 hour/day during cold weather months.

Adult respondents were then questioned as to how many times per day their child washed his/her hands and how many times the child bathed or showered per week, during both warm and cold weather months. This information provided an estimate of the time between skin contact with soil and removal of soil by washing (i.e., exposure time). Hand washing and bathing frequencies for child players are reported in Table 16-41. Based on these results, hand washing occurred a median of 4 times per day during both warm and cold weather months. The median frequency for baths and showers was estimated to be 7 times per week for both warm and cold weather.

Based on reported household incomes, the respondents sampled in SCS-II tended to have higher incomes than that of the general population. This may be explained by the fact that phone surveys cannot sample households without telephones. Additional uncertainty or error in the study results may have occurred as a result of the use of surrogate respondents. Adult respondents were questioned regarding child activities that may have occurred in prior seasons, introducing the chance of recall error. In some instances, a respondent did not know the answer to a question or refused to answer. Table 16-42 compares mean play duration data from SCS-II to similar activities identified in NHAPS (U.S. EPA, 1996). Table 16-43 compares the number of times per day a child washed his or her hands, based on data from SCS-II and NHAPS. As indicated in Tables 16-42 and 16-43, where comparison is possible, NHAPS and SCS-II results showed similarities in observed behaviors.

16.3.2.7 *Graham and McCurdy, 2004 - Developing Meaningful Cohorts for Human Exposure Models*

Graham and McCurdy (2004) used a statistical model [general linear model and analysis of variance (GLM/ANOVA)] to assess the significance of various factors in explaining variation in time spent outdoors, indoors and in motor vehicles. These factors, which are commonly used in developing cohorts for exposure modeling, included age, gender, weather, ethnicity, day type, and precipitation. Activity pattern data from CHAD, containing 30 or more records per day, were used in the analysis (Graham and McCurdy, 2004).

Data on time spent outdoors for people who spent >0 time outdoors (i.e., doers) are presented in Table 16-44. Graham and McCurdy (2004) found that all the factors evaluated were significant ($p<0.001$) in explaining differences in time spent outdoors (Graham and McCurdy, 2004). An evaluation of gender differences in time spent outdoors by age cohorts was also conducted. Table 16-45 presents descriptive statistics and the results of the two-sample Kolmogorov-Smirnov (KS) test for this evaluation. As shown in Table 16-45, there were statistically significant gender differences in time spent outdoors starting with the 6 to 10 year old age category. In addition, Graham and McCurdy (2004) evaluated the effect of physical activity and concluded that this was the most important factor in explaining time spent outdoors. For time spent indoors (Table 16-46), there were statistically significant effects for all the factors evaluated, with gender, weather, and day type being the most important variables. Regarding time spent in motor vehicles (Table 16-47), precipitation was the only factor found to have no significant effects (Graham and McCurdy, 2004).

Based on the results of these analysis, Graham and McCurdy (2004) noted that "besides age and gender, other important attributes for defining cohorts are the physical activity level of individuals, weather factors such as daily maximum temperature in combination with months of the year, and combined weekday/weekend with employment status." The authors also noted that even though the factors evaluated were found to be statistically significant in explaining differences in time spent outdoors, indoors, and in motor vehicles, "parameters such as lifestyle and life stages that are absent from CHAD might have reduced the amount of unexplained variance." The authors recommended that, in defining cohorts for exposure modeling, age and gender should be used as ''first-order'' attributes, followed by physical activity

level, daily maximum temperature, and day type (weekend/weekday or day-of-the-week/working status) (Graham and McCurdy, 2004).

16.3.2.8 *Vandewater et al., 2004 - Linking Obesity and Activity Level with Children's Television and Video Game Use*

Vandewater et al. (2004) evaluated children's media use and participation in active and sedentary activities using 24-hour time-use diaries collected in 1997, as part of the Child Development Supplement (CDS) to the Panel Study of Income Dynamics (PSID). The PSID is a ongoing, longitudinal study of U.S. individuals and their families conducted by the Survey Research Center of the University of Michigan. In 1997, PSID families with children younger than 12 years of age completed the CDS and reported all activities performed by the children on one randomly selected weekday and one randomly selected weekend day. Since minorities, low income families, and less educated individuals were oversampled in the PSID, sample weights were applied to the data (Vandewater et al., 2004). More information on the CDS can be found on-line at http://psidonline.isr.umich.edu/CDS/.

Using time diary data from 2,831 children participating in the CDS, Vandewater et al., (2004) estimated the time in minutes over the two-day study period (i.e., sum of time spent on one weekday and one weekend day) that children spent watching television, playing games on video games consoles or computers, reading, and using computers for other purposes besides playing games. In addition, the time spent participating in highly active (i.e., playing sports), moderately active (i.e., fishing, boating, camping, taking music lessons, and singing), and sedentary (i.e., using the phone, doing puzzles, playing board games, and relaxing) activities was determined. Table 16-48 presents the means and standard deviations for the time spent in the selected activities by age and gender.

A limitation of this study is that the survey was not designed for exposure assessment purposes. Therefore, the time use data set may be biased. However, the survey provides a database of current information on various human activities. This information can be used to assess various exposure pathways and scenarios associated with these activities.

16.3.2.9 *Juster et al. (2004) - Changing Times of American Youth: 1983-2003*

Juster et al. (2004) evaluated changes in time use patterns of children by comparing data collected in a 1981-1982 pilot study of children ages 6 to 17 to data from the 2002-2003 Child Development Supplement (CDS) to the Panel Study of Income Dynamics (PSID). The 1981-1982 pilot study is the same study described in Timmer et al. (1985). The 2002-2003 CDS gathered 24-hour time diary data on 2,908 children ages 6 to 17; as was done in the 1997 CDS, information was collected on one randomly selected weekday and one randomly selected weekend day (Juster et al., 2004).

Tables 16-49 and 16-50 present the mean time children spent (in minutes/day) performing major activities on weekdays and weekend days, respectively, for the years 1981-82 and 2002-2003. Table 16-51 shows the weekly time spent in these activities for the years 1981-82 and 2002-2003. Juster et al. (2004) noted that the time spent in school and studying increased while time spent in active sports and outdoors activities decreased during the period studied.

16.3.2.10 *U.S. Department of Labor, 2007 - American Time Use Survey, 2006 Results*

The American Time Use Study (ATUS) has been conducted annually since 2003 by the U.S. Department of Labor's Bureau of Labor Statistics (U.S. DL, 2007). The purpose of the study is to collect "data on what activities people do during the day and how much time they spend doing them." In 2006, the survey focused on "the time Americans worked, did household activities, cared for household children, participated in educational activities, and engaged in leisure and sports activities." Approximately 13,000 individuals, 15 years of age and older, were interviewed during 2006. Participants were randomly selected and interviewed using the CATI method and were asked to recall their activities on the day before the interview. Data were collected for all days of the week, including weekends (i.e., 10 percent of the individuals were interviewed about their activities on one of the five weekdays, and 25 percent of the individuals were interviewed about their activities on one of the two weekend days). Demographic information, including age, gender, race/ethnicity, marital status, and educational level were also collected, and sample weights were applied to

records to "reduce bias in the estimates due to differences in sampling and response rates across subpopulations and days of the week." Data were collected for 17 major activities, that were subsequently composited into 12 categories for publication of the results. Estimates of time use in these 12 major categories are presented in Table 16-52. These data represent the average hours per day spent by male, female, and all children ages 15 to 19 years in the various categories. Table 16-52 also provides a more detailed breakdown of the Leisure and Sports category for all children, ages 15 to 19 years old.

16.3.2.11 ***Nader et al. 2008 - Moderate-to-Vigorous Physical Activity from Ages 9 to 15 years***

Nader et al. (2008) conducted a longitudinal study of 1,032 children from ages 9 to 15 years. The purpose of the study was to determine the amount of time children 9 to 15 years of age engaged in moderate-to-vigorous activities (MVPA) and compare results with the recommendations issued by the U.S. Department of Health and Human Services and the U.S. Department of Agriculture of a minimum of 60 minutes per day. Children's activity levels were recorded for four to seven days using an accelerometer. The study participants included 517 boys and 515 girls. The study found that at age 9 children engaged in 3 hours of MVPA per day. By age 15, the amount of time engaged in MVPA was dropped to 49 minutes/day on weekdays and 35 minutes per day on weekends. Boys spent 18 more minutes/day of MVPA than girls on weekdays and 13 more minutes/day on weekends. Estimates of the mean time spent in moderate-to-vigorous activities by various age groups are presented in Table 16-53. The study did not provide information about the amount of time spent at specific activities.

16.4 REFERENCES FOR CHAPTER 16

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Table 16-3. Mean Time (minutes/day) Children Under 12 Years of Age Spent in Ten Major Activity Categories, for All Respondents and Doers

Activity Category	Mean Duration (All)	% Doers[a]	Mean Duration (Doers)[a]	Median Duration (Doers)[a]	Maximum Duration (Doers)[a]	Detailed Activity with Highest Average Minutes
Work-related[b]	10	25	39	30	405	Eating at Work/School/Daycare
Household[c]	53	86	61	40	602	Travel to Household
Childcare[d]	<1	<1	83	30	290	Other Child Care
Goods/Services [e]	21	26	81	60	450	Errands
Personal Needs and Care[f]	794	100	794	770	1,440	Night Sleep
Education[g]	110	35	316	335	790	School Classes
Organizational Activities[h]	4	4	111	105	435	Attend Meetings
Entertain/Social [i]	15	17	87	60	490	Visiting with Others
Recreation [j]	239	92	260	240	835	Games
Communication/Passive Leisure [k]	192	93	205	180	898	TV Use
Don't know/Not coded	2	4	41	15	600	-
All Activities	1,440	-	-	-	-	-

[a] Doers indicate the respondents who reported participating in each activity category.

[b] Includes: travel to and during work/school; children's paid work; eating at work/school/daycare; and accompanying or watching adult at work.

[c] Includes: food preparation; meal cleanup; cleaning; clothes care; car and home repair/painting; building a fire; plant and pet care; and traveling to household.

[d] Includes: baby and child care; helping/teaching children; talking and reading; playing while caring for children; medical care; travel related to child care; and other care.

[e] Includes: shopping; medical appointments; obtaining personal care services (e.g., haircuts), government and financial services, and repairs; travel related to goods an services; and errands.

[f] Includes: bathing, showering, and going to bathroom; medical care; help and care; meals; night sleep and daytime naps, dressing and grooming; and travel for personal care.

[g] Includes: student and other classes; daycare; homework; library; and travel for education.

[h] Includes: attending meetings and associated travel.

[i] Includes: sports events; eating and amusements; movies and theater; visiting museums, zoos, art galleries, etc.; visiting others; parties and other social events; and travel to social activities.

[j] Includes: active sports; leisure; hobbies; crafts; art; music/drama/dance; games; playing; and travel to leisure activities.

[k] Includes: radio and television use; reading; conversation; paperwork; other passive leisure; and travel to passive leisure activities.

Source: Wiley et al., 1991.

Table 16-4. Mean Time (minutes/day) Children Under 12 Years of Age Spent in Ten Major Activity Categories, by Age and Gender

Activity Category[a]	Boys									
	Birth to 1 Month	1 to <3 Months	3 to <6 Months	6 to <12 Months	1 to <2 Years	2 to <3 Years	3 to <6 Years	6 to <11 Years	11 Years[b]	Birth to 11 Years
Work-related	0	0	0	1	8	9	10	12	13	11
Household	12	30	49	28	35	44	44	61	63	58
Childcare	0	0	0	0	0	0	0	0	3	2
Goods/Services	0	16	14	28	27	14	28	22	24	26
Personal Needs and Care	910	1,143	937	919	903	889	802	726	707	802
Education	180[c]	0	75	70	33	69	67	120	120	100
Organizational Activities	0	0	0	0	7	0	5	11	16	6
Entertainment/Social	0	0	0	0	8	6	15	15	43	18
Recreation	0	0	26	104	314	304	294	265	227	228
Communication/Passive Leisure	338	250	339	292	106	103	175	208	226	226
Sample Sizes (Unweighted)	3	7	15	31	54	62	151	239	62	624
Activity Category[a]	Girls									
	Birth to 1 Month	1 to <3 Months	3 to <6 Months	6 to <12 Months	1 to <2 Years	2 to <3 Years	3 to <6 Years	6 to <11 Years	11 Years[b]	Birth to 11 Years
Work-related	0	0	5	1	3	22	9	10	19	11
Household	28	29	23	25	45	65	49	67	78	58
Childcare	0	0	0	0	0	0	0	2	9	2
Goods/Services	0	18	14	24	24	34	31	26	15	26
Personal Needs and Care	1,123	1,115	971	922	894	858	820	747	703	802
Education	0	0	110	94	25	40	81	134	151	100
Organizational Activities	0	0	0	0	0	2	3	8	13	6
Entertainment/Social	0	0	0	1	13	6	16	17	52	18
Recreation	0	0	10	147	256	305	270	224	175	228
Communication/Passive Leisure	290	278	308	226	179	107	161	203	225	189
Sample Sizes (Unweighted)	4	10	11	23	43	50	151	225	59	576

[a] See Table 16-3 for a description of what is included in each activity category.

[b] The source data end at 11 years of age, so the 11 to <16 year category is truncated and the 16 to <21 year category is not included.

[c] The data for this age group and category are two values of zero and one of 540.

Note: Column totals may not sum to 1,440 due to rounding.

Source: U.S. EPA analysis of source data used by Wiley et al., 1991.

Table 16-5. Mean Time (minutes/day) Children Under 12 Years of Age Spent in Ten Major Activity Categories, Grouped by Seasons and Regions

Activity Category[a]	Season					Region of California			
	Winter (Jan-Mar)	Spring (Apr-June)	Summer (July-Sept)	Fall (Oct-Dec)	All Seasons	Southern Coast	Bay Area	Rest of State	All Regions
Work-related	10	10	6	13	10	10	10	8	10
Household	47	58	53	52	53	45	62	55	53
Childcare	<1	1	<1	<1	<1	<1	<1	1	<1
Goods/Services	19	17	26	23	21	20	21	23	21
Personal Needs and Care	799	774	815	789	794	799	785	794	794
Education	124	137	49	131	110	109	115	109	110
Organizational Activities	3	5	5	3	4	2	6	6	4
Entertainment/Social	14	12	12	22	15	17	10	16	15
Recreation	221	243	282	211	239	230	241	249	239
Communication/ Passive Leisure	203	180	189	195	192	206	190	175	192
Don't know/Not coded	<1	2	3	<1	2	1	1	3	2
All Activities[b]	1,442	1,439	1,441	1,441	1,441	1,440	1,442	1,439	1,441
Sample Sizes (Unweighted)	318	204	407	271	1,200	224	263	713	1,200

[a] See Table 16-3 for a description of what is included in each activity category.
[b] The column totals may not be equal to 1,440 due to rounding.

Source: Wiley et al., 1991.

Table 16-6. Time (minutes/day) Children Under 12 Years of Age Spent in Six Major Location Categories, for All Respondents and Doers

Location Category	Mean Duration (All)	% Doers[a]	Mean Duration (Doers)[a]	Median Duration (Doers)[a]	Maximum Duration (Doers)[a]	Detailed Location with Highest Average Time
Home	1,078	99	1,086	1,110	1,440	Home - Bedroom
School/Childcare	109	33	330	325	1,260	School or Daycare Facility
Friend's/Other's House	80	32	251	144	1,440	Friend's/Other's House - Bedroom
Stores, Restaurants, Shopping Places	24	35	69	50	475	Shopping Mall
In-transit	69	83	83	60	1,111	Traveling in Car
Other Locations	79	57	139	105	1,440	Park, Playground
Don't Know/Not Coded	<1	1	37	30	90	-
All Locations	1,440	-	-	-	-	-

[a] Doers indicate the respondents who reported participating in each activity category.

Source: Wiley et al., 1991.

Table 16-7. Mean Time (minutes/day) Children Under 12 Years of Age Spent in Six Location Categories, Grouped by Age and Gender

Location Category	Boys									
	Birth to 1 Month	1 to <3 Months	3 to <6 Months	6 to <12 Months	1 to <2 Years	2 to <3 Years	3 to <6 Years	6 to <11 Years	11 Years[a]	Birth to 11 Years
Home	938	1,295	1,164	1,189	1,177	1,161	1,102	1,016	1,010	1,079
School/Childcare	0	1	26	53	73	86	79	110	99	89
Friend's/Other's House	418	40	127	63	54	69	89	110	111	95
Stores, Restaurants, Shopping Places	0	14	21	36	29	22	24	23	20	24
In-transit	77	51	69	63	56	61	67	64	72	65
Other Locations	7	40	33	36	52	41	78	116	127	88
Don't Know/Not Coded	0	0	0	0	0	0	0	0	0	0
Sample Sizes (Unweighted)	3	7	15	31	54	62	151	239	62	624
Location Category	Girls									
	Birth to 1 Month	1 to <3 Months	3 to <6 Months	6 to <12 Months	1 to <2 Years	2 to <3 Years	3 to <6 Years	6 to <11 Years	11 Years[a]	Birth to 11 Years
Home	1,285	1,341	1,151	1,192	1,162	1,065	1,118	1,012	862	1,058
School/Childcare	0	0	109	99	56	61	78	116	128	95
Friend's/Other's House	0	12	44	32	109	103	66	119	193	103
Stores, Restaurants, Shopping Places	0	13	20	15	21	40	32	25	24	27
In-transit	73	56	42	58	55	86	78	70	95	74
Other Locations	83	19	73	43	38	86	67	97	137	84
Don't Know/Not Coded	0	0	0	0	0	0	1	0	0	0
Sample Sizes (Unweighted)	4	10	11	23	43	50	151	225	59	576

[a] The source data end at 11 years of age, so the 11 to <16 year category is truncated and the 16 to <21 year category is not included.

Note: Column totals may not sum to 1,440 due to rounding.

Source: U.S. EPA analysis of source data used by Wiley et al., 1991.

Table 16-8. Mean Time (minutes/day) Children Under 12 Years of Age Spent in Six Location Categories, Grouped by Season and Region

Location Category	Season					Region of California			
	Winter (Jan-Mar)	Spring (Apr-June)	Summer (July-Sept)	Fall (Oct-Dec)	All Seasons	Southern Coast	Bay Area	Rest of State	All Regions
Home	1,091	1,042	1,097	1,081	1,078	1,078	1,078	1,078	1,078
School/Childcare	119	141	52	124	109	113	103	108	109
Friend's/Other's House	69	75	108	69	80	73	86	86	80
Stores, Restaurants, Shopping Places	22	21	30	24	24	26	23	23	24
In transit	75	75	60	65	69	71	73	63	69
Other Locations	63	85	93	76	79	79	76	81	79
Don't Know/Not Coded	<1	<1	<1	<1	<1	<1	<1	<1	<1
All Locations[a]	1,439	1,439	1,440	1,439	1,439	1,439	1,440	1,440	1,439
Sample Sizes (Unweighted N's)	318	204	407	271	1,200	224	263	713	1,200

[a] The column totals may not sum to 1,440 due to rounding.

Source: Wiley et al., 1991.

Table 16-9. Mean Time (minutes/day) Children Under 12 Years of Age Spent in Proximity to Two Potential Sources of Exposure, Grouped by All Respondents, Age, and Gender

Potential Exposures	Boys									
	Birth to 1Month	1 to <3 Months	3 to <6 Months	6 to <12 Months	1 to <2 Years	2 to <3 Years	3 to <6 Years	6 to <11 Years	11 Years[a]	Birth to 11 Years
Gasoline Fumes	3	9	0	2	1	4	2	2	7	3
Gas Oven Fumes	0	0	2	2	1	3	0	1	0	1
Sample Sizes (Unweighted N's)	3	7	15	31	54	62	151	239	62	624
Potential Exposures	Girls									
	Birth to 1Month	1 to <3 Months	3 to <6 Months	6 to <12 Months	1 to <2 Years	2 to <3 Years	3 to <6 Years	6 to <11 Years	11 Years[a]	Birth to 11 Years
Gasoline Fumes	0	3	0	3	1	2	1	2	1	2
Gas Oven Fumes	0	0	0	0	0	3	2	1	0	1
Sample Sizes (Unweighted N's)	4	10	11	23	43	50	151	225	59	576

[a] The source data end at 11 years of age, so the 11 to <16 year category is truncated and the 16 to <21 year category is not included.

Source: U.S. EPA analysis of source data used by Wiley et al., 1991.

Table 16-10. Mean Time (minutes/day) Children Under 12 Years of Age Spent Indoors and Outdoors, Grouped by Age and Gender

Age Group	Boys			Girls		
	N	Indoors[a]	Outdoors[b]	N	Indoors[a]	Outdoors[b]
Birth to <1 Month	3	1,440	0	4	1,440	0
1 to <3 Months	7	1,432	8	10	1,431	9
3 to <6 Months	15	1,407	33	11	1,421	19
6 to <12 Months	31	1,322	118	23	1,280	160
1 to <2 Years	54	1,101	339	43	1,164	276
2 to <3 Years	62	1,121	319	50	1,102	338
3 to <6 Years	151	1,117	323	151	1,140	300
6 to <11 Years	239	1,145	295	225	1,183	255
11 Years[c]	62	1,166	274	59	1,215	225
All Ages	624	1,181	258	576	1,181	258

[a] Time indoors was estimating by adding the average times spent performing indoor activities (household work, child care, personal needs and care, education, and communication/passive leisure) and half the time spent in each activity which could have occurred either indoors or outdoors (i.e., work-related, goods/services, organizational activities, entertainment/social, don't know/not coded).

[b] Time outdoors was estimated by adding the average time spent in recreation activities and half the time spent in each activity which could have occurred either indoors or outdoors (i.e., work-related, goods/services, organizational activities, entertainment/social, don't know/not coded).

[c] The source data end at 11 years of age, so the 11 to <16 year category is truncated and the 16 to <21 year category is not included.

N = Sample size.

Note: Indoor and outdoor minutes/day may not sum to 1,440 minutes/day due to rounding.

Source: U.S. EPA analysis of source data used by Wiley et al., 1991.

Table 16-11. Time Spent (minutes/day) in Various Rooms at Home and in All Rooms Combined
Whole Population and Doers Only

Age (years)	N	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Kitchen - Whole Population															
Birth to <1	63	36	0	0	0	0	0	0	10	70	109	125	134	158	195
1 to <2	118	56	0	0	0	0	0	0	40	90	132	195	232	242	392
2 to <3	118	48	0	0	0	0	0	0	30	75	120	146	173	188	215
3 to <6	357	47	0	0	0	0	0	0	30	75	105	150	180	222	362
6 to <11	497	42	0	0	0	0	0	0	30	60	105	135	150	196	690
11 to <16	466	37	0	0	0	0	0	0	24	55	90	130	180	249	450
16 to <21	481	34	0	0	0	0	0	0	15	50	90	130	170	195	545
Kitchen - DOERS ONLY															
Birth to <1	33	69	10	10	10	13	15	30	70	90	124	133	157	176	195
1 to <4	76	87	10	10	13	19	30	45	70	110	173	214	240	281	392
2 to <3	80	70	10	10	11	15	15	30	60	105	136	155	184	195	215
3 to <6	252	67	2	5	10	15	15	30	60	90	133	165	210	232	362
6 to <11	342	61	1	2	5	10	15	30	50	79	120	145	172	229	690
11 to <16	323	54	1	2	4	5	10	20	40	65	114	150	218	281	450
16 to <21	305	54	1	2	3	5	10	20	35	65	120	159	194	209	545
Living Room/Family Room/Den - Whole Population															
Birth to <1	63	279	0	0	0	0	0	90	210	420	666	724	788	938	1,180
1 to <2	118	172	0	0	0	0	0	25	120	279	410	533	616	652	810
2 to <3	118	173	0	0	0	0	0	56	138	239	346	499	599	680	1,125
3 to <6	357	164	0	0	0	0	0	45	122	240	376	476	680	742	900
6 to <11	497	137	0	0	0	0	0	30	95	210	322	420	547	612	695
11 to <16	466	170	0	0	0	0	0	36	120	240	395	570	687	774	1,305
16 to <21	481	157	0	0	0	0	0	0	120	240	370	501	690	819	1,080
Living Room/Family Room/Den - DOERS ONLY															
Birth to <1	54	326	25	28	31	57	90	136	268	450	686	744	789	973	1,180
1 to <2	93	219	10	15	19	25	60	90	180	310	444	540	642	667	810
2 to <3	105	195	1	5	10	22	34	90	150	255	377	527	603	691	1,125
3 to <6	290	202	5	8	19	30	50	90	153	270	415	498	705	778	900
6 to <11	403	169	5	10	10	20	30	60	130	240	349	449	579	655	695
11 to <16	380	209	2	10	16	30	45	85	165	275	436	594	705	776	1,305
16 to <21	352	214	5	10	15	24	40	85	165	285	440	547	720	909	1,080

Table 16-11. Time Spent (minutes/day) in Various Rooms at Home and in All Rooms Combined
Whole Population and Doers Only (continued)

Age (years)	N	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Dining Room - Whole Population															
Birth to <1	63	9	0	0	0	0	0	0	0	0	30	70	86	96	105
1 to <2	118	19	0	0	0	0	0	0	0	17	60	90	176	260	315
2 to <3	118	19	0	0	0	0	0	0	0	30	80	105	118	146	150
3 to <6	357	17	0	0	0	0	0	0	0	10	60	96	133	150	300
6 to <11	497	13	0	0	0	0	0	0	0	5	57	70	120	135	225
11 to <16	466	11	0	0	0	0	0	0	0	0	33	65	119	164	390
16 to <21	481	7	0	0	0	0	0	0	0	0	30	45	90	112	330
Dining Room - DOERS ONLY															
Birth to <1	9	60	15	-	-	-	-	-	-	-	-	-	-	-	105
1 to <2	32	72	10	12	13	16	30	34	53	66	110	237	287	301	315
2 to <3	34	65	15	15	15	18	29	30	60	90	105	134	150	150	150
3 to <6	93	65	10	10	10	15	16	30	55	85	120	150	209	286	300
6 to <11	126	53	5	5	5	6	15	30	45	60	98	135	150	196	225
11 to <16	90	59	5	5	5	10	15	30	38	69	122	166	202	283	390
16 to <21	67	50	5	5	7	15	15	20	35	60	90	124	135	201	330
Bathroom - Whole Population															
Birth to <1	63	16	0	0	0	0	0	0	0	30	40	59	81	87	90
1 to <2	118	26	0	0	0	0	0	0	15	30	45	60	80	239	600
2 to <3	118	29	0	0	0	0	0	1	20	30	60	62	138	290	345
3 to <6	357	22	0	0	0	0	0	0	15	30	49	65	90	120	270
6 to <11	497	22	0	0	0	0	0	0	15	30	45	60	81	118	535
11 to <16	466	20	0	0	0	0	0	0	15	30	45	60	86	97	220
16 to <21	481	26	0	0	0	0	0	10	20	32	59	65	105	123	547
Bathroom - DOERS ONLY															
Birth to <1	31	32	5	7	8	10	15	18	30	40	60	78	87	89	90
1 to <2	77	39	6	6	8	10	15	15	30	30	57	60	176	349	600
2 to <3	88	38	2	3	5	12	15	15	30	45	60	70	208	319	345
3 to <6	240	33	1	1	2	5	11	15	30	38	60	75	112	123	270
6 to <11	356	31	1	2	3	5	9	15	25	35	50	60	90	180	535
11 to <16	335	29	1	2	2	5	6	12	20	35	50	64	90	100	220
16 to <21	392	31	1	2	5	5	10	15	25	40	60	72	111	135	547

Table 16-11. Time Spent (minutes/day) in Various Rooms at Home and in All Rooms Combined
Whole Population and Doers Only (continued)

Age (years)	N	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Bedroom - Whole Population															
Birth to <1	63	749	0	0	104	468	566	653	750	863	972	1,092	1,119	1,179	1,275
1 to <2	118	771	0	56	340	443	559	645	808	884	975	1,029	1,190	1,325	1,440
2 to <3	118	701	0	5	91	419	517	618	718	835	894	931	979	990	1,040
3 to <6	357	696	0	92	210	432	540	630	695	790	875	945	1,033	1,135	1,440
6 to <11	497	653	0	0	0	304	480	585	660	735	840	906	1,005	1,096	1,440
11 to <16	466	626	0	0	20	134	403	543	645	745	860	950	1,027	1,118	1,277
16 to <21	481	588	0	0	0	60	335	475	595	720	855	960	1,082	1,146	1,375
Bedroom - DOERS ONLY															
Birth to <1	61	774	435	453	470	495	590	660	750	865	975	1,095	1,119	1,182	1,275
1 to <2	116	785	330	362	384	450	570	656	810	885	975	1,030	1,191	1,328	1,440
2 to <3	116	713	30	215	266	484	520	620	720	836	896	931	981	990	1,040
3 to <6	353	704	165	210	268	464	540	630	695	790	875	945	1,034	1,137	1,440
6 to <11	486	667	120	183	261	439	513	599	660	735	843	912	1,005	1,100	1,440
11 to <16	457	638	15	55	115	179	430	550	646	750	860	951	1,029	1,122	1,277
16 to <21	463	611	15	34	100	273	395	480	600	725	859	974	1,090	1,147	1,375
Garage - Whole Population															
Birth to <1	63	1	0	0	0	0	0	0	0	0	0	0	0	34	89
1 to <2	118	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 to <3	118	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 to <6	357	1	0	0	0	0	0	0	0	0	0	0	0	7	165
6 to <11	497	0	0	0	0	0	0	0	0	0	0	0	0	0	120
11 to <16	466	2	0	0	0	0	0	0	0	0	0	0	19	51	240
16 to <21	481	0	0	0	0	0	0	0	0	0	0	0	0	0	60
Garage - DOERS ONLY															
Birth to <1	1	-	89	-	-	-	-	-	-	-	-	-	-	-	89
1 to <2	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2 to <3	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3 to <6	4	-	15	-	-	-	-	-	-	-	-	-	-	-	165
6 to <11	3	-	30	-	-	-	-	-	-	-	-	-	-	-	120
11 to <16	12	79	10	11	11	13	16	20	40	139	183	210	228	234	240
16 to <21	4	-	10	-	-	-	-	-	-	-	-	-	-	-	60

Table 16-11. Time Spent (minutes/day) in Various Rooms at Home and in All Rooms Combined Whole Population and Doers Only (continued)

Age (years)	N	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
All Rooms Combined - Whole Population															
Birth to <1	63	1,091	0	391	631	742	786	943	1,105	1,258	1,440	1,440	1,440	1,440	1,440
1 to <2	118	1,047	0	63	377	651	705	915	1,050	1,239	1,440	1,440	1,440	1,440	1,440
2 to <3	118	971	0	66	342	640	727	852	995	1,120	1,232	1,295	1,354	1,369	1,440
3 to <6	357	951	0	284	402	621	716	810	930	1,110	1,245	1,354	1,440	1,440	1,440
6 to <11	497	873	0	0	0	420	631	758	880	1,005	1,175	1,275	1,374	1,440	1,440
11 to <16	466	876	0	0	117	370	575	751	871	1,043	1,215	1,314	1,440	1,440	1,440
16 to <21	481	819	0	0	165	375	510	645	810	995	1,170	1,287	1,419	1,440	1,440
All Rooms Combined- DOERS ONLY															
Birth to <1	62	1,108	630	633	658	751	821	956	1,108	1,259	1,440	1,440	1,440	1,440	1,440
1 to <2	116	1,065	370	399	495	674	715	923	1,050	1,243	1,440	1,440	1,440	1,440	1,440
2 to <3	117	979	30	288	551	650	746	857	1,005	1,120	1,232	1,296	1,355	1,369	1,440
3 to <6	355	957	150	352	451	634	720	810	930	1,110	1,245	1,355	1,440	1,440	1,440
6 to <11	486	893	190	335	389	541	655	765	885	1,009	1,177	1,275	1,385	1,440	1,440
11 to <16	459	889	40	141	300	441	590	758	875	1,046	1,218	1,315	1,440	1,440	1,440
16 to <21	473	833	85	206	321	433	525	660	815	1,000	1,170	1,288	1,420	1,440	1,440

N = Sample size.
Min = Minimum.
Max = Maximum.
- = Percentiles were not calculated for sample sizes less than 10.

Source: U.S. EPA re-analysis of source data from U.S. EPA, 1996 (NHAPS).

Table 16-12. Time Spent (minutes/day) at Selected Indoor Locations
Whole Population and Doers Only

Age (years)	N	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Restaurants - Whole Population															
Birth to <1	63	13	0	0	0	0	0	0	0	0	45	69	105	194	330
1 to <2	118	7	0	0	0	0	0	0	0	0	30	62	88	102	120
2 to <3	118	9	0	0	0	0	0	0	0	0	45	62	92	111	120
3 to <6	357	7	0	0	0	0	0	0	0	0	21	52	90	120	130
6 to <11	497	6	0	0	0	0	0	0	0	0	15	45	85	110	180
11 to <16	466	10	0	0	0	0	0	0	0	0	35	60	90	137	315
16 to <21	481	35	0	0	0	0	0	0	0	20	105	240	380	466	645
Restaurants - DOERS ONLY															
Birth to <1	10	85	10	-	-	-	-	-	-	-	-	-	-	-	330
1 to <2	15	58	5	6	8	12	21	33	55	83	99	110	116	118	120
2 to <3	17	63	20	21	22	24	28	45	60	80	102	116	118	119	120
3 to <6	43	57	4	7	9	10	16	30	45	90	120	120	122	126	130
6 to <11	57	54	5	5	6	10	15	30	45	60	107	124	140	158	180
11 to <16	78	59	2	3	7	10	18	30	45	65	102	141	223	283	315
16 to <21	135	126	1	4	5	10	17	30	60	170	334	437	537	546	645
School - Whole Population															
Birth to <1	63	4	0	0	0	0	0	0	0	0	0	0	46	100	165
1 to <2	118	13	0	0	0	0	0	0	0	0	0	22	156	453	665
2 to <3	118	23	0	0	0	0	0	0	0	0	0	193	414	503	545
3 to <6	357	75	0	0	0	0	0	0	0	0	416	540	569	589	630
6 to <11	497	187	0	0	0	0	0	0	0	397	444	480	552	601	665
11 to <16	466	201	0	0	0	0	0	0	0	420	459	495	578	630	855
16 to <21	481	131	0	0	0	0	0	0	0	308	430	495	566	629	855
School - DOERS ONLY															
Birth to <1	2	-	60	-	-	-	-	-	-	-	-	-	-	-	165
1 to <2	8	-	5	-	-	-	-	-	-	-	-	-	-	-	665
2 to <3	11	251	10	10	10	10	10	83	269	388	510	528	538	542	545
3 to <6	71	379	5	23	34	110	160	228	418	540	570	590	615	627	630
6 to <11	235	396	5	64	129	195	305	370	400	435	480	540	612	643	665
11 to <16	229	409	15	38	96	132	290	395	420	450	495	559	631	696	855
16 to <21	171	367	15	22	31	90	185	270	388	440	525	576	726	801	855

Table 16-12. Time Spent (minutes/day) at Selected Indoor Locations
Whole Population and Doers Only (continued)

Age (years)	N	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Grocery/Convenience Stores, Other Stores, and Malls - Whole Population															
Birth to <1	63	39	0	0	0	0	0	0	0	30	98	178	224	241	250
1 to <2	118	16	0	0	0	0	0	0	0	0	62	87	146	202	255
2 to <3	118	18	0	0	0	0	0	0	0	0	60	86	133	250	360
3 to <6	357	17	0	0	0	0	0	0	0	0	62	111	189	223	420
6 to <11	497	14	0	0	0	0	0	0	0	0	49	101	167	225	320
11 to <16	466	18	0	0	0	0	0	0	0	0	54	122	204	300	413
16 to <21	481	36	0	0	0	0	0	0	0	15	120	230	402	484	960
Grocery/Convenience Stores, Other Stores, and Malls - DOERS ONLY															
Birth to <1	21	88	5	5	5	5	24	30	55	130	190	235	244	247	250
1 to <2	23	81	5	7	9	17	30	55	65	93	152	205	235	245	255
2 to <3	27	80	10	11	13	20	33	45	60	82	120	234	313	337	360
3 to <6	64	96	5	5	5	16	23	50	73	116	204	236	339	382	420
6 to <11	91	76	3	3	5	5	14	20	60	110	170	230	255	262	320
11 to <16	104	82	1	2	5	10	10	20	45	120	199	300	359	383	413
16 to <21	146	120	2	4	5	5	10	22	60	149	330	456	517	562	960

N = Sample size.
Min = Minimum.
Max = Maximum.
- = Percentiles were not calculated for sample sizes less than 10.

Source: U.S. EPA re-analysis of source data from U.S. EPA, 1996 (NHAPS).

Table 16-13. Time Spent (minutes/day) in Selected Outdoor Locations
Whole Population and Doers Only

Age (years)	N	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
School Grounds/Playground - Whole Population															
Birth to <1	63	2	0	0	0	0	0	0	0	0	0	0	0	53	140
1 to <2	118	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 to <3	118	4	0	0	0	0	0	0	0	0	0	0	50	131	175
3 to <6	357	5	0	0	0	0	0	0	0	0	0	0	64	127	625
6 to <11	497	8	0	0	0	0	0	0	0	0	10	60	121	170	315
11 to <16	466	10	0	0	0	0	0	0	0	0	20	80	120	160	570
16 to <21	481	8	0	0	0	0	0	0	0	0	0	50	135	180	510
School Grounds/Playground - DOERS ONLY															
Birth to <1	1	-	140	-	-	-	-	-	-	-	-	-	-	-	140
1 to <2	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2 to <3	5	-	10	-	-	-	-	-	-	-	-	-	-	-	175
3 to <6	12	138	20	22	24	31	42	59	118	138	150	364	521	573	625
6 to <11	52	80	10	10	10	10	15	30	59	106	169	217	280	298	315
11 to <16	62	72	3	4	5	5	5	21	53	95	149	178	217	360	570
16 to <21	34	116	10	10	10	13	18	46	95	161	201	305	418	464	510
Parks or Golf Courses - Whole Population															
Birth to <1	63	3	0	0	0	0	0	0	0	0	0	0	45	63	85
1 to <2	118	3	0	0	0	0	0	0	0	0	0	0	0	25	360
2 to <3	118	12	0	0	0	0	0	0	0	0	0	24	126	246	755
3 to <6	357	10	0	0	0	0	0	0	0	0	0	71	163	220	585
6 to <11	497	16	0	0	0	0	0	0	0	0	0	72	328	483	665
11 to <16	466	19	0	0	0	0	0	0	0	0	0	114	265	452	1,065
16 to <21	481	22	0	0	0	0	0	0	0	0	0	150	381	546	870
Parks or Golf Courses - DOERS ONLY															
Birth to <1	3	-	30	-	-	-	-	-	-	-	-	-	-	-	85
1 to <2	2	-	30	-	-	-	-	-	-	-	-	-	-	-	360
2 to <3	7	-	21	-	-	-	-	-	-	-	-	-	-	-	755
3 to <6	26	144	25	26	28	31	44	63	113	165	273	388	505	545	585
6 to <11	34	236	25	30	35	43	52	73	123	394	568	644	662	663	665
11 to <16	38	237	15	15	15	15	27	86	164	266	470	851	954	1,010	1,065
16 to <21	47	225	1	7	14	15	24	60	160	308	557	633	677	773	870

Table 16-13. Time Spent (minutes/day) in Selected Outdoor Locations
Whole Population and Doers Only (continued)

Age (years)	N	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Pool, River, or Lake - Whole Population															
Birth to <1	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 to <2	118	1	0	0	0	0	0	0	0	0	0	0	0	0	118
2 to <3	118	12	0	0	0	0	0	0	0	0	0	14	228	352	435
3 to <6	357	5	0	0	0	0	0	0	0	0	0	0	85	163	630
6 to <11	497	9	0	0	0	0	0	0	0	0	0	0	220	295	375
11 to <16	466	4	0	0	0	0	0	0	0	0	0	0	60	160	235
16 to <21	481	8	0	0	0	0	0	0	0	0	0	0	145	240	570
Pool, River, or Lake - DOERS ONLY															
Birth to <1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1 to <2	1	-	118	-	-	-	-	-	-	-	-	-	-	-	118
2 to <3	6	-	95	-	-	-	-	-	-	-	-	-	-	-	435
3 to <6	9	-	45	-	-	-	-	-	-	-	-	-	-	-	630
6 to <11	24	178	25	26	27	32	46	75	155	294	319	359	370	373	375
11 to <16	16	121	58	58	59	59	60	60	85	206	225	228	232	234	235
16 to <21	22	179	20	22	24	31	40	55	125	238	415	548	564	567	570

N = Sample size.
Min = Minimum.
Max = Maximum.
- = Percentiles were not calculated for sample sizes less than 10.

Source: U.S. EPA re-analysis of source data from U.S. EPA, 1996 (NHAPS).

Table 16-14. Mean Time Spent (minutes/day) Inside and Outside, by Age Category

Age (years)	N	Average Indoor Minutes[a]	Average Outdoor Minutes[b]	Average Unclassified Minutes[c]
Birth to <1	25	1,353	44	43
1 to < 2	90	1,353	36	51
2 to <3	131	1,316	76	48
3 to <6	360	1,278	107	54
6 to <11	511	1,244	132	64
11 to <16	449	1,260	100	80
16 to <21	493	1,248	102	90

[a] Time indoors was estimating by adding the average times spent indoors at the respondents' home (kitchen, living room, bathroom, etc.), at other houses, and inside other locations such as school, restaurants, etc.

[b] Time outdoors was estimated by adding the average time spent outdoors at the respondents' pool and yard, others' pool and yard, and outside other locations such as sidewalk, street, neighborhood, parking lot, service station/gas station, school grounds, park/golf course, pool, river, lake, farm, etc.

[c] Includes time spent in vehicles or in activities that could not be assigned an indoor or outdoor location.

N = Sample size.

Source: U.S. EPA re-analysis of source data from U.S. EPA, 1996 (NHAPS).

Table 16-15. Time Spent (minutes/day) in Selected Vehicles and All Vehicles Combined
Whole Population and Doers Only

Age (years)	N	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Car - Whole Population															
Birth to <1	63	36	0	0	0	0	0	0	10	49	107	171	208	220	235
1 to <2	118	41	0	0	0	0	0	0	20	60	98	151	246	336	390
2 to <3	118	33	0	0	0	0	0	0	20	50	90	126	163	187	215
3 to <6	357	43	0	0	0	0	0	0	20	60	117	155	221	272	620
6 to <11	497	37	0	0	0	0	0	0	15	55	102	146	185	212	630
11 to <16	466	39	0	0	0	0	0	0	15	55	99	150	254	302	900
16 to <21	481	61	0	0	0	0	0	8	40	90	155	195	249	321	380
Car - DOERS ONLY															
Birth to <1	35	65	2	5	7	10	14	20	40	73	159	203	218	227	235
1 to <2	68	72	5	8	10	10	15	30	58	85	147	186	323	363	390
2 to <3	73	54	4	4	4	8	10	24	42	65	118	141	181	197	215
3 to <6	227	67	4	4	5	7	10	25	45	88	150	180	267	327	620
6 to <11	317	58	1	2	2	5	10	20	40	82	127	163	202	300	630
11 to <16	286	64	1	3	5	5	10	20	40	75	122	193	279	338	900
16 to <21	364	81	2	9	10	10	17	30	60	105	180	210	275	334	380
Truck (Pickup or Van) - Whole Population															
Birth to <1	63	2	0	0	0	0	0	0	0	0	0	0	0	42	110
1 to <2	118	2	0	0	0	0	0	0	0	0	0	0	52	81	90
2 to <3	118	14	0	0	0	0	0	0	0	0	14	31	124	201	955
3 to <6	357	5	0	0	0	0	0	0	0	0	0	30	60	114	245
6 to <11	497	7	0	0	0	0	0	0	0	0	15	45	95	110	240
11 to <16	466	9	0	0	0	0	0	0	0	0	15	59	153	181	352
16 to <21	481	11	0	0	0	0	0	0	0	0	25	90	150	190	445
Truck (Pickup or Van) - DOERS ONLY															
Birth to <1	1	-	110	-	-	-	-	-	-	-	-	-	-	-	110
1 to <2	5	-	20	-	-	-	-	-	-	-	-	-	-	-	90
2 to <3	15	109	10	10	10	10	11	15	30	53	188	434	746	851	955
3 to <6	34	53	1	2	4	8	10	16	30	59	117	207	222	233	245
6 to <11	69	48	1	4	6	10	10	15	30	65	110	124	151	186	240
11 to <16	62	67	5	5	5	5	7	15	35	89	180	185	258	299	352
16 to <21	70	78	5	5	5	10	11	22	54	115	170	213	238	304	445

Table 16-15. Time Spent (minutes/day) in Selected Vehicles and All Vehicles Combined Whole Population and Doers Only (continued)

Age (years)	N	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Bus - Whole Population															
Birth to <1	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 to <2	118	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 to <3	118	1	0	0	0	0	0	0	0	0	0	0	0	25	120
3 to <6	357	2	0	0	0	0	0	0	0	0	0	0	30	47	80
6 to <11	497	11	0	0	0	0	0	0	0	0	50	70	90	110	140
11 to <16	466	16	0	0	0	0	0	0	0	15	60	89	119	148	370
16 to <21	481	6	0	0	0	0	0	0	0	0	0	45	108	135	225
Bus - DOERS ONLY															
Birth to <1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1 to <2	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2 to <3	2	-	30	-	-	-	-	-	-	-	-	-	-	-	120
3 to <6	14	40	15	16	16	18	21	30	33	49	67	74	77	79	80
6 to <11	115	49	5	5	6	14	17	25	43	67	90	107	120	122	140
11 to <16	130	58	7	10	10	10	15	30	54	71	101	131	159	175	370
16 to <21	41	75	10	12	14	20	25	30	60	100	135	175	193	209	225
All Vehicles - Whole Population															
Birth to <1	63	39	0	0	0	0	0	0	20	60	113	171	208	220	235
1 to <2	118	44	0	0	0	0	0	0	28	60	98	151	246	336	390
2 to <3	118	50	0	0	0	0	0	0	30	60	120	151	203	214	955
3 to <6	357	50	0	0	0	0	0	0	30	65	122	167	238	272	620
6 to <11	497	57	0	0	0	0	0	15	40	85	124	155	212	289	630
11 to <16	466	67	0	0	0	0	0	15	45	85	155	206	291	383	900
16 to <21	481	84	0	0	0	0	0	25	62	120	180	239	328	382	675
All Vehicles - DOERS ONLY															
Birth to <1	37	66	2	5	8	10	16	20	46	75	151	202	217	226	235
1 to <2	72	72	5	9	10	10	20	30	60	85	143	178	316	362	390
2 to <3	86	69	4	4	5	10	10	26	45	83	128	166	212	326	955
3 to <6	261	68	1	4	6	10	13	30	46	85	150	190	261	309	620
6 to <11	417	68	1	2	4	10	14	25	55	90	130	161	240	306	630
11 to <16	383	82	1	5	5	10	16	30	60	99	177	235	314	392	900
16 to <21	428	94	5	8	10	15	20	40	75	120	190	240	345	386	675

N = Sample size.
Min = Minimum.
Max = Maximum.
- = Percentiles were not calculated for sample sizes less than 10.

Source: U.S. EPA re-analysis of source data from U.S. EPA, 1996 (NHAPS).

Table 16-16. Time Spent (minutes/day) in Selected Activities
Whole Population and Doers Only

Age (years)	N	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Sleeping/Napping - Whole Population															
Birth to <1	63	782	485	519	546	579	613	668	762	873	1,011	1,080	1,121	1,144	1,175
1 to <2	118	779	360	483	510	579	627	700	780	855	925	962	987	1098	1,320
2 to <3	118	716	270	365	470	523	594	635	708	805	870	917	937	944	990
3 to <6	357	681	0	480	510	539	573	630	675	735	795	840	893	916	1,110
6 to <11	497	613	120	295	390	458	510	570	625	660	720	750	831	868	945
11 to <16	466	569	0	320	376	415	450	510	558	630	705	762	809	907	1,015
16 to <21	481	537	0	239	295	360	390	450	525	615	690	750	840	906	1,317
Sleeping/Napping - DOERS ONLY															
Birth to <1	63	782	485	519	546	579	613	668	762	873	1,011	1,080	1,121	1,144	1,175
1 to <2	118	779	360	483	510	579	627	700	780	855	925	962	987	1,098	1,320
2 to <3	118	716	270	365	470	523	594	635	708	805	870	917	937	944	990
3 to <6	356	683	420	491	510	540	578	630	675	738	795	840	893	916	1,110
6 to <11	497	613	120	295	390	458	510	570	625	660	720	750	831	868	945
11 to <16	465	571	150	341	379	415	450	510	560	630	705	762	809	907	1,015
16 to <21	480	538	85	252	299	360	390	450	525	615	690	751	840	906	1,317
Eating - Whole Population															
Birth to <1	63	117	0	6	12	36	45	73	110	145	194	224	334	345	345
1 to <2	118	98	0	10	10	29	40	60	90	120	167	206	233	244	270
2 to <3	118	92	15	15	15	20	30	60	89	120	157	176	198	208	270
3 to <6	357	78	0	0	0	15	28	45	75	105	135	150	180	217	265
6 to <11	497	65	0	0	0	10	20	35	60	88	115	139	155	176	255
11 to <16	466	52	0	0	0	0	10	30	45	74	100	120	146	162	205
16 to <21	481	52	0	0	0	0	0	20	40	65	105	135	192	210	630
Eating - DOERS ONLY															
Birth to <1	62	118	10	16	23	40	46	77	110	148	195	224	335	345	345
1 to <2	117	99	10	10	12	30	40	60	90	120	167	206	234	244	270
2 to <3	118	92	15	15	15	20	30	60	89	120	157	176	198	208	270
3 to <6	349	80	2	10	15	20	30	45	75	105	135	150	180	218	265
6 to <11	480	67	5	10	10	15	20	40	60	90	115	140	157	179	255
11 to <16	432	56	2	5	7	10	20	30	50	75	100	125	148	163	205
16 to <21	426	59	2	5	9	10	15	30	45	75	105	144	197	210	630

Table 16-16. Time Spent (minutes/day) in Selected Activities
Whole Population and Doers Only (continued)

Age (years)	N	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Attending School Full-Time - Whole Population															
Birth to <1	63	11	0	0	0	0	0	0	0	0	0	0	83	265	550
1 to <2	118	28	0	0	0	0	0	0	0	0	0	204	546	594	665
2 to <3	118	65	0	0	0	0	0	0	0	0	334	502	564	618	710
3 to <6	357	73	0	0	0	0	0	0	0	0	392	510	558	581	630
6 to <11	497	183	0	0	0	0	0	0	0	390	435	460	525	570	645
11 to <16	466	187	0	0	0	0	0	0	0	409	445	464	487	500	595
16 to <21	481	117	0	0	0	0	0	0	0	270	408	445	489	551	825
Attending School Full-Time - DOERS ONLY															
Birth to <1	3	-	60	-	-	-	-	-	-	-	-	-	-	-	550
1 to <2	9	-	20	-	-	-	-	-	-	-	-	-	-	-	665
2 to <3	20	385	20	37	53	103	119	226	458	520	576	632	679	694	710
3 to <6	71	366	30	37	66	128	165	203	395	510	558	583	615	627	630
6 to <11	234	389	60	125	164	211	311	370	390	425	460	497	570	600	645
11 to <16	217	401	10	86	108	270	343	385	415	440	467	485	505	548	595
16 to <21	162	347	20	46	78	126	195	270	370	420	459	519	567	609	825
Outdoor Recreation -Whole Population															
Birth to <1	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 to <2	118	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 to <3	118	4	0	0	0	0	0	0	0	0	0	0	15	28	370
3 to <6	357	6	0	0	0	0	0	0	0	0	0	0	60	172	630
6 to <11	497	7	0	0	0	0	0	0	0	0	0	0	142	226	574
11 to <16	466	6	0	0	0	0	0	0	0	0	0	0	142	191	465
16 to <21	481	6	0	0	0	0	0	0	0	0	0	0	103	189	570
Outdoor Recreation - DOERS ONLY															
Birth to <1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1 to <2	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2 to <3	4	-	15	-	-	-	-	-	-	-	-	-	-	-	370
3 to <6	11	207	30	30	30	30	30	60	150	240	585	608	621	626	630
6 to <11	17	204	60	60	60	60	66	120	165	245	351	403	506	540	574
11 to <16	22	138	5	5	5	5	11	60	126	180	234	411	446	456	465
16 to <21	13	228	30	35	41	57	77	130	180	300	420	480	534	552	570

Table 16-16. Time Spent (minutes/day) in Selected Activities
Whole Population and Doers Only (continued)

Age (years)	N	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Active Sports - Whole Population															
Birth to <1	63	15	0	0	0	0	0	0	0	0	60	90	131	143	155
1 to <2	118	20	0	0	0	0	0	0	0	0	68	131	180	201	270
2 to <3	118	27	0	0	0	0	0	0	0	0	110	180	257	319	390
3 to <6	357	40	0	0	0	0	0	0	0	30	135	242	330	408	630
6 to <11	497	51	0	0	0	0	0	0	0	60	172	272	371	435	975
11 to <16	466	53	0	0	0	0	0	0	0	74	168	245	309	425	1,065
16 to <21	481	35	0	0	0	0	0	0	0	0	145	180	285	386	565
Active Sports - DOERS ONLY															
Birth to <1	13	75	25	26	26	28	31	40	60	90	132	143	150	153	155
1 to <2	24	96	10	15	19	30	33	60	73	131	180	201	240	255	270
2 to <3	26	124	15	18	20	26	30	41	98	179	253	314	360	375	390
3 to <6	97	149	15	20	29	30	30	60	120	180	315	354	559	625	630
6 to <11	175	146	2	12	15	20	30	60	110	193	312	393	450	522	975
11 to <16	179	137	5	5	15	15	30	60	115	180	261	314	442	533	1,065
16 to <21	117	143	5	15	15	20	30	60	120	180	272	371	501	519	565
Exercise - Whole Population															
Birth to <1	63	13	0	0	0	0	0	0	0	0	0	0	122	354	670
1 to <2	118	2	0	0	0	0	0	0	0	0	0	0	25	30	150
2 to <3	118	1	0	0	0	0	0	0	0	0	0	0	0	0	60
3 to <6	357	3	0	0	0	0	0	0	0	0	0	0	0	54	525
6 to <11	497	5	0	0	0	0	0	0	0	0	0	0	100	137	450
11 to <16	466	5	0	0	0	0	0	0	0	0	0	30	70	114	245
16 to <21	481	8	0	0	0	0	0	0	0	0	0	60	151	176	300
Exercise - DOERS ONLY															
Birth to <1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1 to <2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2 to <3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3 to <6	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 to <11	20	124	15	17	19	25	30	60	100	146	226	284	384	417	450
11 to <16	28	75	20	21	23	27	30	42	60	101	128	148	194	219	245
16 to <21	41	99	15	15	15	25	30	40	90	145	180	240	260	280	300

Table 16-16. Time Spent (minutes/day) in Selected Activities
Whole Population and Doers Only (continued)

Age (years)	N	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Walking - Whole Population															
Birth to <1	63	6	0	0	0	0	0	0	0	0	9.2	29	64	104	160
1 to <2	118	2	0	0	0	0	0	0	0	0	0	10	40	58	60
2 to <3	118	3	0	0	0	0	0	0	0	0	10	17	45	54	60
3 to <6	357	3	0	0	0	0	0	0	0	0	4	20	35	60	60
6 to <11	497	4	0	0	0	0	0	0	0	0	14	30	40	55	170
11 to <16	466	10	0	0	0	0	0	0	0	0	30	55	79	130	190
16 to <21	481	8	0	0	0	0	0	0	0	0	20	45	90	127	410
Walking - DOERS ONLY															
Birth to <1	9	-	4	-	-	-	-	-	-	-	-	-	-	-	160
1 to <2	9	-	4	-	-	-	-	-	-	-	-	-	-	-	60
2 to <3	19	19	1	1	1	2	2	7	10	28	51	56	58	59	60
3 to <6	44	20	1	1	1	1	2	5	15	30	56	60	60	60	60
6 to <11	118	18	1	1	1	2	2	5	10	25	40	51	65	94	170
11 to <16	190	25	1	1	1	2	3	5	14	30	60	78	134	154	190
16 to <21	128	30	1	1	2	2	3	5	18	32	62	120	148	175	410

N = Sample size.
Min = Minimum.
Max = Maximum.
- = Percentiles were not calculated for sample sizes less than 10.

Source: U.S. EPA re-analysis of source data from U.S. EPA, 1996 (NHAPS).

Table 16-17. Number of Showers Taken per Day, by Number of Respondents

Age (years)	N	Showers per Day				
		0	1	2	3	Don't Know
Birth to <1	37	36	1	0	0	0
1 to <2	53	48	5	0	0	0
2 to <3	67	54	10	2	0	1
3 to <6	187	153	25	7	1	1
6 to <11	245	122	95	25	1	2
11 to <16	258	51	150	53	3	1
16 to <21	232	23	147	57	5	0

N = Total number.

Source: U.S. EPA re-analysis of source data from U.S. EPA, 1996 (NHAPS).

Table 16-18. Time Spent (minutes) Bathing, Showering, and in Bathroom Immediately after Bathing and Showering

Age (years)	N	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Duration of Bath (minutes)															
Birth to <1	26	19	5	5	5	6	8	10	18	28	30	30	45	53	60
1 to <2	37	23	10	10	10	10	10	15	20	30	30	32	41	43	45
2 to <3	48	23	1	2.9	5	7	10	15	20	30	30	45	60	60	60
3 to <6	125	24	5	5	5	6	10	15	25	30	35	60	60	61	61
6 to <11	89	24	5	5	5	10	10	15	20	30	31	46	60	60	61
11 to <16	38	25	5	6	6	10	10	16	20	30	40	43	60	61	61
16 to <21	17	33	10	11	12	14	18	20	30	45	60	60	61	61	61
Duration in Bathroom Immediately Following a Bath (minutes)															
Birth to <1	26	2	0	0	0	0	0	0	1	3	9	10	10	10	10
1 to <2	37	3	0	0	0	0	0	1	2	5	5	6	10	10	10
2 to <3	48	4	0	0	0	0	0	0	1.5	5	10	15	15	18	20
3 to <6	125	4	0	0	0	0	0	1	2	5	10	15	15	19	30
6 to <11	89	4	0	0	0	0	0	1	3	5	10	10	16	21	30
11 to <16	38	9	0	0	0	1	1	2	5	14	20	26	33	36	40
16 to <21	17	11	0	0	1	2	3	5	10	10	19	29	39	42	45
Sum of Duration in Bath and in Bathroom Immediately Following Bath (minutes)															
Birth to <1	26	22	6	7	8	9	10	12	19	29	32	38	55	63	70
1 to <2	37	26	10	10	11	12	16	17	30	32	35	41	46	48	50
2 to <3	48	26	6	7	8	10	14	16	23	34	45	50	60	61	61
3 to <6	125	28	5	6	7	10	12	18	30	32	48	60	66	69	76
6 to <11	89	28	6	6	9	10	13	20	25	33	41	60	63	71	80
11 to <16	38	33	7	8	10	12	16	23	31	41	52	64	70	70	70
16 to <21	17	45	15	15	16	17	21	30	40	60	73	77	82	83	85

Table 16-18. Time Spent (minutes) Bathing, Showering, and in Bathroom Immediately after Bathing and Showering (continued)

Age (years)	N	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Duration of Shower (minutes)															
Birth to <1	1	15	15	-	-	-	-	-	-	-	-	-	-	-	15
1 to <2	5	20	5	-	-	-	-	-	-	-	-	-	-	-	30
2 to <3	12	22	5	5	5	5	6	14	20	30	30	44	53	57	60
3 to <6	33	17	3	4	4	5	5	10	15	20	30	34	47	54	60
6 to <11	119	18	4	5	5	5	7	10	15	20	30	41	57	60	60
11 to <16	204	18	3	4	5	5	6	10	15	20	30	40	50	60	60
16 to <21	207	20	3	5	5	5	8	10	15	30	40	45	60	60	61
Duration in Shower Room Immediately Following a Shower (minutes)															
Birth to <1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	1
1 to <2	5	10	0	-	-	-	-	-	-	-	-	-	-	-	45
2 to <3	12	5	0	0	0	1	1	1	4	6	10	12	14	14	15
3 to <6	33	7	0	0	1	2	2	3	5	10	15	20	22	23	25
6 to <11	119	6	0	0	0	0	1	2	5	10	13	16	26	30	30
11 to <16	204	8	0	0	0	0	1	3	5	10	19	30	40	45	60
16 to <21	207	8	0	0	0	0	1	3	5	10	15	20	30	39	61
Sum of Shower Duration and Time Spent in Shower Room Immediately Following Shower (minutes)															
Birth to <1	1	16	16	-	-	-	-	-	-	-	-	-	-	-	16
1 to <2	5	30	6	-	-	-	-	-	-	-	-	-	-	-	60
2 to <3	12	27	6	6	7	8	11	19	21	33	44	56	65	67	70
3 to <6	33	24	8	8	8	8	8	13	25	30	40	45	57	64	70
6 to <11	119	24	5	6	6	8	10	15	20	30	43	50	61	68	90
11 to <16	204	26	4	5	7	10	11	15	22	35	50	60	65	70	70
16 to <21	207	28	4	5	7	10	10	15	25	35	50	60	74	89	121

N = Doer sample size.
Min = Minimum.
Max = Maximum.
\- = Percentiles were not calculated for sample sizes less than 10.
Note: A value of “61" was used for any shower, bath, or bathroom stay longer than 60 minutes. A value of "121" for the sum of shower duration and time spent in bathroom following shower (or the sum of bath duration and time spent in bathroom following bath) signifies that more than 120 minutes were spent.

Source: U.S. EPA re-analysis of source data from U.S. EPA, 1996 (NHAPS).

Table 16-19. Range of Number of Times Washing the Hands at Specified Daily Frequencies by the Number of Respondents

Age (years)	N	Number of Times/Day							
		0	1-2	3-5	6-9	10-19	20-29	30+	DK
Birth to <1	37	2	15	12	2	1	1	0	4
1 to <2	53	7	8	23	8	4	0	2	1
2 to <3	67	0	15	39	10	0	1	0	2
3 to <6	187	2	37	101	27	10	1	2	7
6 to <11	245	2	47	131	34	16	3	1	11
11 to <16	258	8	37	128	49	22	5	2	7
16 to <21	232	0	23	115	47	38	4	3	2

N = Total number.
DK = Respondents answered "don't know".

Source: U.S. EPA re-analysis of source data from U.S. EPA, 1996 (NHAPS).

Table 16-20. Number of Times Swimming in a Month in Freshwater Swimming Pool by the Number of Respondents

Age (years)	N	Times/Month															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Birth to <1	10	1	4	1	0	0	2	0	0	0	1	0	0	0	0	0	0
1to < 2	8	2	3	1	0	1	0	0	1	0	0	0	0	0	0	0	0
2 to <3	18	3	4	1	0	1	1	0	1	1	2	0	2	0	0	1	0
3 to <6	45	5	7	6	5	2	1	1	2	0	2	0	0	1	1	5	0
6 to <11	76	15	10	5	5	5	3	1	3	0	6	0	5	0	0	7	2
11 to <16	66	19	10	6	3	5	4	1	3	1	4	0	1	0	0	2	0
16 to <21	50	6	6	2	6	6	2	2	1	0	5	1	1	0	0	0	0

Age (years)	N	Times/Month															
		18	20	23	24	25	26	28	29	30	32	40	42	45	50	60	DK
Birth to <1	10	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
1to < 2	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 to <3	18	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
3 to <6	45	0	2	0	0	1	0	0	0	3	1	0	0	0	0	0	0
6 to <11	76	0	3	0	1	1	0	0	0	3	0	0	0	0	1	0	0
11 to <16	66	1	2	0	0	0	0	0	0	2	0	0	0	0	0	1	1
16 to <21	50	0	6	0	0	1	2	0	0	3	0	0	0	0	0	0	0

N = Doer sample size.
DK = Respondents answered “don't know”.

Source: U.S. EPA re-analysis of source data from U.S. EPA, 1996 (NHAPS).

Table 16-21. Time Spent (minutes/month) Swimming in Freshwater Swimming Pool

Age (years)	N	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Birth to <1	10	96	6	-	-	-	-	-	-	-	-	-	-	-	181
1 to <2	7	105	45	-	-	-	-	-	-	-	-	-	-	-	181
2 to <3	18	116	15	16	17	19	27	60	120	181	181	181	181	181	181
3 to <6	42	137	6	8	9	12	40	83	181	181	181	181	181	181	181
6 to <11	72	151	8	13	17	30	60	150	181	181	181	181	181	181	181
11 to <16	65	139	4	8	11	20	30	90	181	181	181	181	181	181	181
16 to <21	50	145	2	3	5	25	39	124	181	181	181	181	181	181	181

N = Doer sample size.
Min = Minimum.
Max = Maximum.
- = Percentiles were not calculated for sample sizes of 10 or fewer.
Note: A value of 181 for number of minutes signifies that more than 180 minutes were spent.

Source: U.S. EPA re-analysis of source data from U.S. EPA, 1996 (NHAPS).

Table 16-22. Time Spent (minutes/day) Playing on Dirt, Sand/Gravel, or Grass
Whole Population and Doers only

Age (years)	N	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Playing on Dirt - Whole Population															
Birth to <1	11	15	0	0	0	0	0	0	0	10	20	71	**101**	**111**	**121**
1 to <2	37	20	0	0	0	0	0	0	0	10	84	121	**121**	**121**	**121**
2 to <3	61	18	0	0	0	0	0	0	0	20	60	120	**121**	**121**	**121**
3 to <6	179	29	0	0	0	0	0	0	0	59	120	121	**121**	**121**	**121**
6 to <11	98	28	0	0	0	0	0	0	0	60	120	121	**121**	**121**	**121**
11 to <16	35	25	0	0	0	0	0	0	1	30	77	120	**120**	**121**	**121**
16 to <21	7	9	0	-	-	-	-	-	-	-	-	-	**-**	**-**	**30**
Playing on Dirt - DOERS ONLY															
Birth to <1	5	33	2	-	-	-	-	-	-	-	-	-	-	-	121
1 to <2	13	56	5	5	5	5	6	10	45	120	121	121	121	121	121
2 to <3	24	47	5	5	5	5	7	15	30	60	121	121	121	121	121
3 to <6	82	63	1	1	1	1	6	30	60	120	121	121	121	121	121
6 to <11	44	63	2	3	5	10	15	30	60	120	121	121	121	121	121
11 to <16	18	49	1	2	2	4	9	19	30	60	120	120	121	121	121
16 to <21	2	30	30	-	-	-	-	-	-	-	-	-	-	-	30
Playing on Sand/Gravel - Whole Population															
Birth to <1	10	4	0	-	-	-	-	-	-	-	-	-	-	-	20
1 to <2	37	17	0	0	0	0	0	0	0	30	60	84	121	121	121
2 to <3	58	24	0	0	0	0	0	0	0	30	120	121	121	121	121
3 to <6	186	30	0	0	0	0	0	0	2	60	120	121	121	121	121
6 to <11	101	30	0	0	0	0	0	0	0	60	120	121	121	121	121
11 to <16	36	30	0	0	0	0	0	0	0	38	120	121	121	121	121
16 to <21	8	42	0	-	-	-	-	-	-	-	-	-	-	-	121
Playing on Sand/Gravel - DOERS ONLY															
Birth to <1	2	18	15	-	-	-	-	-	-	-	-	-	-	-	20
1 to <2	15	43	5	5	5	5	7	15	30	60	103	121	121	121	121
2 to <3	26	53	1	1	1	1	3	10	30	120	121	121	121	121	121
3 to <6	93	60	3	3	3	5	8	25	60	90	121	121	121	121	121
6 to <11	46	67	5	7	10	11	15	30	60	120	121	121	121	121	121
11 to <16	16	67	1	3	5	12	15	26	60	120	121	121	121	121	121
16 to <21	4	83	30	-	-	-	-	-	-	-	-	-	-	-	121

Table 16-22. Time Spent (minutes/day) Playing on Dirt, Sand/Gravel, or Grass
Whole Population and Doers Only (continued)

Age (years)	N	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Playing on Grass - Whole Population															
Birth to <1	11	43	0	0	0	0	0	2	30	73	**121**	**121**	**121**	**121**	**121**
1 to <2	38	62	0	0	0	0	9	16	60	120	**121**	**121**	**121**	**121**	**121**
2 to <3	59	55	0	0	0	0	1	15	30	120	**121**	**121**	**121**	**121**	**121**
3 to <6	180	69	0	0	0	0	0	28	60	121	**121**	**121**	**121**	**121**	**121**
6 to <11	99	62	0	0	0	0	0	20	60	120	**121**	**121**	**121**	**121**	**121**
11 to <16	36	67	0	0	0	0	1	30	60	120	**121**	**121**	**121**	**121**	**121**
16 to <21	8	45	0	-	-	-	-	-	-	-	**-**	**-**	**-**	**-**	**120**
Playing on Grass - DOERS ONLY															
Birth to <1	9	52	1	-	-	-	-	-	-	-	-	-	-	-	121
1 to <2	35	68	5	7	8	10	15	25	60	120	121	121	121	121	121
2 to <3	53	62	1	2	3	3	5	20	60	120	121	121	121	121	121
3 to <6	157	79	1	2	2	10	15	60	70	121	121	121	121	121	121
6 to <11	85	73	1	5	9	11	17	30	60	120	121	121	121	121	121
11 to <16	32	75	1	5	10	23	30	30	60	120	121	121	121	121	121
16 to <21	6	60	15	-	-	-	-	-	-	-	-	-	-	-	120

N = Sample size.
Min = Minimum.
Max = Maximum.
- = Percentiles were not calculated for sample sizes of 10 or fewer.
Note: A value of "121" for number of minutes signifies that more than 120 minutes were spent.

Source: U.S. EPA re-analysis of source data from U.S. EPA, 1996 (NHAPS).

Table 16-23. Time Spent (minutes/day) Working or Being Near Excessive Dust in the Air

Age (years)	N	Mean	Min	Percentiles											Max
				1	2	5	10	25	50	75	90	95	98	99	
Birth to <1	2	63	5	-	-	-	-	-	-	-	-	-	-	-	121
1 to <2	5	44	0	-	-	-	-	-	-	-	-	-	-	-	121
2 to <3	1	121	121	-	-	-	-	-	-	-	-	-	-	-	121
3 to <6	15	63	0	0	1	1	2	8	60	121	121	121	121	121	121
6 to <11	12	60	0	0	0	1	2	5	45	121	121	121	121	121	121
11 to <16	14	53	0	0	0	1	2	6	38	113	121	121	121	121	121
16 to <21	14	65	2	2	3	4	7	16	53	121	121	121	121	121	121

N = Doer sample size.
Min = Minimum.
Max = Maximum.
- = Percentiles were not calculated for sample sizes of 10 or fewer.
Note: A value of "121" for number of minutes signifies that more than 120 minutes were spent.

Source: U.S. EPA re-analysis of source data from U.S. EPA, 1996 (NHAPS).

Table 16-24. Time Spent (minutes/day) with Smokers Present

Age (years)	N	Mean	SD	SE	Min	Percentiles								Max
						5	25	50	75	90	95	98	99	
1 to 4	155	367	325	26	5	30	90	273	570	825	1,010	1,140	1,305	1,440
5 to 11	224	318	314	21	1	25	105	190	475	775	1,050	1,210	1,250	1,440
12 to 17	256	246	244	15	1	10	60	165	360	595	774	864	1,020	1,260

N = Doer sample size.
Min = Minimum.
Max = Maximum.

Source: U.S. EPA, 1996 (NHAPS).

Table 16-25. Mean Time Spent (minutes/day) Performing Major Activities, by Age, Sex and Type of Day

Activity	Age (3 to 11 years)				Age (12 to 17 years)			
	Weekdays		Weekends		Weekdays		Weekends	
	Boys (N=118)	Girls (N=111)	Boys (N=118)	Girls (N=111)	Boys (N=77)	Girls (N=83)	Boys (N=77)	Girls (N=83)
Market Work	16	0	7	4	23	21	58	25
Household Work	17	21	32	43	16	40	46	89
Personal Care	43	44	42	50	48	71	35	76
Eating	81	78	78	84	73	65	58	75
Sleeping	584	590	625	619	504	478	550	612
School	252	259	-	-	314	342	-	-
Studying	14	19	4	9	29	37	25	25
Church	7	4	53	61	3	7	40	36
Visiting	16	9	23	37	17	25	46	53
Sports	25	12	33	23	52	37	65	26
Outdoors	10	7	30	23	10	10	36	19
Hobbies	3	1	3	4	7	4	4	7
Art Activities	4	4	4	4	12	6	11	9
Playing	137	115	177	166	37	13	35	24
TV	117	128	181	122	143	108	187	140
Reading	9	7	12	10	10	13	12	19
Household Conversations	10	11	14	9	21	30	24	30
Other Passive Leisure	9	14	16	17	21	14	43	33
NA	22	25	20	29	14	17	10	4
Percent of Time Accounted for by Activities Above	94	92	93	89	93	92	88	89

N = Sample size.
NA = Unknown.
- = No data.

Source: Timmer et al., 1985.

Table 16-26. Mean Time Spent (minutes/day) in Major Activities, by Type of Day for Five Different Age Groups

Activity	Weekday					Weekend					Significant Effects[a]
	Age (years)					Age (years)					
	3-5	6-8	9-11	12-14	15-17	3-5	6-8	9-11	12-14	15-17	
Market Work	-	14	8	14	28	-	4	10	29	48	
Personal Care	41	49	40	56	60	47	45	44	60	51	A,S,AxS (F>M)
Household Work	14	15	18	27	34	17	27	51	72	60	A,S, AxS (F>M)
Eating	82	81	73	69	67	81	80	78	68	65	A
Sleeping	630	595	548	473	499	634	641	596	604	562	A
School	137	292	315	344	314	-	-	-	-	-	
Studying	2	8	29	33	33	1	2	12	15	30	A
Church	4	9	9	9	3	55	56	53	32	37	A
Visiting	14	15	10	21	20	10	8	13	22	56	A (Weekend Only)
Sports	5	24	21	40	46	3	30	42	51	37	A,S (M>F)
Outdoor Activities	4	9	8	7	11	8	23	39	25	26	
Hobbies	0	2	2	4	6	1	5	3	8	3	
Art Activities	5	4	3	3	12	4	4	4	7	10	
Other Passive Leisure	9	1	2	6	4	6	10	7	10	18	A
Playing	218	111	65	31	14	267	180	92	35	21	A,S (M>F)
TV	111	99	146	142	108	122	136	185	169	157	A,S, AxS (M>F)
Reading	5	5	9	10	12	4	9	10	10	18	A
Being Read to	2	2	0	0	0	3	2	0	0	0	A
NA	30	14	23	25	7	52	7	14	4	9	A

[a] Effects are significant for weekdays and weekends, unless otherwise specified. A = age effect, $P<0.05$, for both weekdays and weekend activities; S = sex effect $P<0.05$, F>M, M>F = females spend more time than males, or vice versa; and AxS = age by sex interaction, $P<0.05$.

NA = Unknown.

\- = No data.

Source: Timmer et al., 1985.

Table 16-27. Mean Time Spent (hours/day) Indoors and Outdoors, by Age and Day of the Week

Age Group	Indoors[a]		Outdoors[b]	
	Weekday	Weekend	Weekday	Weekend
3 to 5 years	19.4	18.9	2.5	3.1
6 to 8 years	20.7	18.6	1.8	2.5
9 to 11 years	20.8	18.6	1.3	2.3
12 to 14 years	20.7	18.5	1.6	1.9
15 to 17 years	19.9	17.9	1.4	2.3

[a] Time indoors was estimated by adding the average times spent performing indoor activities (household work, personal care, eating, sleeping, attending school, studying, attending church, watching television, and engaging in conversation) and half the time spent in each activity which could have occurred either indoors or outdoors (i.e., market work, sports, hobbies, art activities, playing, reading, and other passive leisure).

[b] Time outdoors was estimated by adding the average time spent in outdoor activities and half the time spent in each activity which could have occurred either indoors or outdoors (i.e., market work, sports, hobbies, art activities, playing, reading, and other passive leisure).

Source: Adapted from Timmer et al., 1985.

Table 16-28. Mean Time Spent (minutes/day) in Various Microenvironments, Children Ages 12 to 17 Years National and California Surveys

Microenvironment	National Data Mean (Standard Error)[a]	
	All N = 340	Doers Only[b]
Autoplaces	2 (1)	73
Restaurant/Bar	9 (2)	60
In-vehicle/Internal Combustion	79 (7)	88
In-Vehicle/Other	0 (0)	12
Physical/Outdoors	32 (8)	130
Physical/Indoors	15 (3)	87
Work/Study-Residence	22 (4)	82
Work/Study-Other	159 (14)	354
Cooking	11 (3)	40
Other Activities/Kitchen	53 (4)	64
Chores/Child	91 (7)	92
Shop/Errands	26 (4)	68
Other/Outdoors	70 (13)	129
Social/Cultural	87 (10)	120
Leisure-Eat/Indoors	237 (16)	242
Sleep/Indoors	548 (31)	551
Microenvironment	CARB Data Mean (Standard Error)[a]	
	All N = 183	Doer Only[b]
Autoplaces	16 (8)	124
Restaurant/Bar	16 (4)	44
In-Vehicle/Internal Combustion	78 (11)	89
In-Vehicle/Other	1 (0)	19
Physical/Outdoors	32 (7)	110
Physical/Indoors	20 (4)	65
Work/Study-Residence	25 (5)	76
Work/Study-Other	196 (30)	339
Cooking	3 (1)	19
Other Activities/Kitchen	31 (4)	51
Chores/Child	72 (11)	77
Shop/Errands	14 (3)	50
Other/Outdoors	58 (8)	78
Social/Cultural	63 (14)	109
Leisure-Eat/Indoors	260 (27)	270
Sleep/Indoors	557 (44)	560

[a] Weighted values.

[b] Doers only = respondents who reported participating in each activity/microenvironment.

Source: Robinson and Thomas, 1991.

Table 16-29. Gender and Age Groups

Age Group [a]	N
6 to 8 years (males)	145
6 to 8 years (females)	124
9 to 11 years (males)	156
9 to 11 years(females)	160
12 to 17 years (males)	98
12 to 17 years (females)	85

[a] Children under the age of 6 were excluded because there were too few responses in the CARB study.

N = Sample size.

Source: Funk et al., 1998.

Table 16-30. Assignment of At-Home Activities to Inhalation Rate Levels for Children

Low	Moderate
Watching child care	Outdoor cleaning
Night sleep	Food Preparation
Watch personal care	Metal clean-up
Homework	Cleaning house
Radio use	Clothes care
TV use	Car/boat repair
Records/tapes	Home repair
Reading books	Plant care
Reading magazines	Other household
Reading newspapers	Pet care
Letters/writing	Baby care
Other leisure	Child care
Homework/watch TV	Helping/teaching
Reading/TV	Talking/reading
Reading/listen music	Indoor playing
Paperwork	Outdoor playing
	Medical child care
	Washing, hygiene
	Medical care
	Help and care
	Meals at home
	Dressing
	Visiting at home
	Hobbies
	Domestic crafts
	Art
	Music/dance/drama
	Indoor dance
	Conservations
	Painting room/home
	Building fire
	Washing/dressing
	Outdoor play
	Playing/eating
	Playing/talking
	Playing/watch TV
	TV/eating
	TV/something else
	Reading book/eating
	Read magazine/eat
	Read newspaper/eat

Source: Funk et al., 1998.

Table 16-31. Aggregate Time Spent (minutes/day) At-Home in Activity Groups, by Adolescents and Children[a]

Activity Group	Adolescents		Children	
	Mean	SD	Mean	SD
Low	789	230	823	153
Moderate	197	131	241[b]	136
High	1	11	3	17
$High_{participants}$[c]	43	72	58	47

[a] Time spent engaging in all activities embodied by inhalation rate category (minutes/day).
[b] Significantly different from adolescents ($p < 0.05$).
[c] Represents time spent at-home by individuals participating in high inhalation rate level activities (i.e., doers).
SD = Standard deviation.

Source: Funk et al., 1998.

Table 16-32. Comparison of Mean Time Spent (minutes/day) At-Home, by Gender (Adolescents)

Activity Group	Male		Female	
	Mean	SD	Mean	SD
Low	775	206	804	253
Moderate	181	126	241	134
High	2	16	0	0

SD = Standard deviation.

Source: Funk et al., 1998.

Table 16-33. Comparison of Mean Time Spent (minutes/day) At-Home, by Gender and Age for Children[a]

Activity Group	Males				Females			
	6-8 Years		9-11 Years		6-8 Years		9-11 Years	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Low	806	134	860	157	828	155	803	162
Moderate	259	135	198	111	256	141	247	146
High	3	17	7	27	1	9	2	10
$High_{participant}$[b]	77	59	70	54	68	11	30	23

[a] Time spent engaging in all activities embodied by inhalation rate category (minutes/day).
[b] Participants in high inhalation rate activities (i.e., doers).
SD = Standard deviation.

Source: Funk et al., 1998.

Table 16-34. Number of Person-Days/Individuals[a] for Children in CHAD Database

Age Group	All Studies	California[b]	Cincinnati[c]	NHAPS-Air	NHAPS-Water
0 Year	223/199	104	36/12	39	44
0 to 6 Months	-	50	15/5	-	-
6 to 12 Months	-	54	21/7	-	-
1 Year	259/238	97	31/11	64	67
12 to 18 Months	-	57	-	-	-
18 to 24 Months	-	40	-	-	-
2 Years	317/264	112	81/28	57	67
3 Years	278/242	113	54/18	51	60
4 Years	259/232	91	41/14	64	63
5 Years	254/227	98	40/14	52	64
6 Years	237/199	81	57/19	59	40
7 Years	243/213	85	45/15	57	56
8 Years	259/226	103	49/17	51	55
9 Years	229/195	90	51/17	42	46
10 Years	224/199	105	38/13	39	42
11 Years	227/206	121	32/11	44	30
Total	3,009/2,640	1,200	556/187	619	634

[a] The number of person-days of data are the same as the number of individuals for all studies except for the Cincinnati study. Since up to three days of activity pattern data were obtained from each participant in this study, the number of person-days of data is approximately three times the number of individuals.

[b] The California study referred to in this table is the Wiley et al. (1991) study.

[c] The Cincinnati study referred to in this table is the Johnson (1989) study.

\- = No data.

Source: Hubal et al., 2000.

Table 16-35. Time Spent (hours/day) in Various Microenvironments, by Age

Age (years)	Average Time ± Standard Deviation (Percent >0 Hours)				
	Indoors at Home	Outdoors at Home	Indoors at School	Outdoors at Park	In Vehicle
0	19.6 ± 4.3 (99)	1.4 ± 1.5 (20)	3.5 ± 3.7 (2)	1.6 ± 1.5 (9)	1.2 ± 1.0 (65)
1	19.5 ± 4.1 (99)	1.6 ± 1.3 (35)	3.4 ± 3.8 (5)	1.9 ± 2.7 (10)	1.1 ± 0.9 (66)
2	17.8 ± 4.3 (100)	2.0 ± 1.7 (46)	6.2 ± 3.3 (9)	2.0 ± 1.7 (17)	1.2 ± 1.5 (76)
3	18.0 ± 4.2 (100)	2.1 ± 1.8 (48)	5.7 ± 2.8 (14)	1.5 ± 0.9 (17)	1.4 ± 1.9 (73)
4	17.3 ± 4.3 (100)	2.4 ± 1.8 (42)	4.9 ± 3.2 (16)	2.3 ± 1.9 (20)	1.1 ± 0.8 (78)
5	16.3 ± 4.0 (99)	2.5 ± 2.1 (52)	5.4 ± 2.5 (39)	1.6 ± 1.5 (28)	1.3 ± 1.8 (80)
6	16.0 ± 4.2 (98)	2.6 ± 2.2 (48)	5.8 ± 2.2 (34)	2.1 ± 2.4 (32)	1.1 ± 0.8 (79)
7	15.5 ± 3.9 (99)	2.6 ± 2.0 (48)	6.3 ± 1.3 (40)	1.5 ± 1.0 (28)	1.1 ± 1.1 (77)
8	15.6 ± 4.1 (99)	2.1 ± 2.5 (44)	6.2 ± 1.1 (41)	2.2 ± 2.4 (37)	1.3 ± 2.1 (82)
9	15.2 ± 4.3 (99)	2.3 ± 2.8 (49)	6.0 ± 1.5 (39)	1.7 ± 1.5 (34)	1.2 ± 1.2 (76)
10	16.0 ± 4.4 (96)	1.7 ± 1.9 (40)	5.9 ± 1.5 (39)	2.2 ± 2.3 (40)	1.1 ± 1.1 (82)
11	14.9 ± 4.6 (98)	1.9 ± 2.3 (45)	5.9 ± 1.5 (41)	2.0 ± 1.7 (44)	1.6 ± 1.9 (74)

Source: Hubal et al., 2000.

Table 16-36. Mean Time Children Spent (hours/day) Doing Various Macroactivities While Indoors at Home

Age (years)	Mean Time (Percent >0 Hours)						
	Eat	Sleep or Nap	Shower or Bathe	Play Games	Watch TV or Listen to Radio	Read, Write, Homework	Think, Relax, Passive
0	1.9 (96)	12.6 (99)	0.4 (44)	4.3 (29)	1.1 (9)	0.4 (4)	3.3 (62)
1	1.5 (97)	12.1 (99)	0.5 (56)	3.9 (68)	1.8 (41)	0.6 (19)	2.3 (20)
2	1.3 (92)	11.5 (100)	0.5 (53)	2.5 (59)	2.1 (69)	0.6 (27)	1.4 (18)
3	1.2 (95)	11.3 (99)	0.4 (53)	2.6 (59)	2.6 (81)	0.8 (27)	1.0 (19)
4	1.1 (93)	10.9 (100)	0.5 (52)	2.6 (54)	2.5 (82)	0.7 (31)	1.1 (17)
5	1.1 (95)	10.5 (98)	0.5 (54)	2.0 (49)	2.3 (85)	0.8 (31)	1.2 (19)
6	1.1 (94)	10.4 (98)	0.4 (49)	1.9 (35)	2.3 (82)	0.9 (38)	1.1 (14)
7	1.0 (93)	9.9 (99)	0.4 (56)	2.1 (38)	2.5 (84)	0.9 (40)	0.6 (10)
8	0.9 (91)	10.0 (96)	0.4 (51)	2.0 (35)	2.7 (83)	1.0 (45)	0.7 (7)
9	0.9 (90)	9.7 (96)	0.5 (43)	1.7 (28)	3.1 (83)	1.0 (44)	0.9 (17)
10	1.0 (86)	9.6 (94)	0.4 (43)	1.7 (38)	3.5 (79)	1.5 (47)	0.6 (10)
11	0.9 (89)	9.3 (94)	0.4 (45)	1.9 (27)	3.1 (85)	1.1 (47)	0.6 (10)

Source: Hubal et al., 2000.

Table 16-37. Time Children Spent (hours/day) in Various Microenvironments, by Age
Recast into New Standard Age Categories

Age Group	N	Indoors at Home		Outdoors at Home		Indoors at School		Outdoors at Park		In Vehicle	
		Mean Time	% Doing	Mean TIme	% Doing	Mean Time	% Doing	Mean Time	% Doing	Mean TIme	% Doing
Birth to <1 month	123	19.6	98	1.7	21	4.3	3	1.3	3	1.3	63
1 to <3 months	33	20.9	100	1.8	9	0.2	3	1.6	9	1.3	27
3 to <6 months	120	19.6	100	0.8	8	7.8	7	1.3	6	1.1	14
6 to <12 months	287	19.1	99	1.1	15	7.6	8	1.8	5	1.3	14
1 to <2 years	728	19.2	99	1.4	34	6.4	9	1.5	5	1.1	27
2 to <3 years	765	18.2	99	1.8	38	6.8	12	2.1	7	1.3	28
3 to <6 years	2,110	17.3	100	1.9	43	5.9	26	1.6	10	1.3	29
6 to <11 years	3,283	15.7	99	1.9	40	6.5	44	2.1	17	1.1	29
11 to <16 years	2,031	15.5	97	1.7	30	6.6	45	2.6	15	1.3	42
16 to <21 years	1,005	14.6	98	1.4	20	5.7	33	3.1	10	1.7	90

N = Sample size.

Source: Based on data source used by Hubal et al., 2000 (CHAD).

Table 16-38. Time Children Spent (hours/day) in Various Macroactivities While Indoors at Home Recast Into New Standard Age Categories

Age Group	N	Eat		Sleep or Nap		Shower or Bathe		Play Games		Watch TV/ Listen to Radio		Read, Write, Homework		Think, Relax, Passive	
		Mean Time	% Doing	Mean Time	% Doing	Mean Time	% Doing	Mean Time	% Doing	Mean Time	% Doing	Mean Time	% Doing	Mean TIme	% Doing
Birth to <1 month	123	2.2	98	13.0	100	0.5	41	5.0	53	1.3	8	0.7	2	2.7	48
1 to <3 months	33	2.4	100	14.8	100	0.4	24	0.7	6	1.6	15	0.0	0	3.5	79
3 to <6 months	120	2.0	100	13.5	100	0.5	9	1.3	31	1.0	21	1.1	3	2.5	59
6 to <12 months	287	1.8	100	12.9	100	0.4	11	1.1	30	1.3	25	0.5	4	2.5	35
1 to <2 years	728	1.7	99	12.5	100	0.5	21	3.2	45	1.8	52	0.6	13	1.4	26
2 to <3 years	765	1.5	98	12.0	100	0.5	22	2.6	45	2.0	77	0.6	18	0.8	30
3 to <6 years	2,110	1.4	99	11.2	100	0.5	38	2.5	38	2.3	86	0.7	25	0.8	28
6 to <11 years	3,283	1.2	98	10.2	100	0.4	54	2.0	28	2.6	84	1.0	43	0.8	20
11 to <16 years	2,031	1.1	94	9.7	98	0.4	50	1.8	18	3.0	85	1.4	45	0.8	20
16 to <21 years	1,005	1.0	84	8.9	98	0.4	45	1.9	5	3.2	73	2.2	37	1.3	24

N = Sample size.

Source: Based on data source used by Hubal et al., 2000 (CHAD).

Table 16-39. Number and Percentage of Respondents with Children and Those Reporting Outdoor Play[a] Activities in both Warm and Cold Weather

Source	Respondents with Children	Child Players[a]		Child non-Players		Warm Weather Playersa	Cold Weather Players	Players in Both Seasons
	N	N	%	N	%	N	N	%
SCS-II base	197	128	65.0	69	35.0	127	100	50.8
SCS-II over sample	483	372	77.0	111	23.0	370	290	60.0
Total	680	500	73.5	180	26.5	497	390	57.4

[a] "Play" and "player" refer specifically to participation in outdoor play on bare dirt or mixed grass and dirt.
[b] Does not include three "Don't know/refused" responses regarding warm weather play.
N = Sample size.

Source: Wong et al., 2000.

Table 16-40. Play Frequency and Duration for all Child Players (from SCS-II data)

Statistic	Cold Weather			Warm Weather		
	Frequency (days/week)	Duration (hours/day)	Total (hours/week)	Frequency (days/week)	Duration (hours/day)	Total (hours/week)
N	372	374	373	488	479	480
5th Percentile	1	1	1	2	1	4
50th Percentile	3	1	5	7	3	20
95th Percentile	7	4	20	7	8	50

N = Sample size.

Source: Wong et al., 2000.

Table 16-41. Hand Washing and Bathing Frequency for all Child Players (from SCS-II data)

Statistic	Cold Weather		Warm Weather	
	Hand washing (times/day)	Bathing (times/week)	Hand washing (times/day)	Bathing (times/week)
N	329	388	433	494
5th Percentile	2	2	2	3
50th Percentile	4	7	4	7
95th Percentile	10	10	12	14

N = Sample size.

Source: Wong et al., 2000.

Table 16-42. NHAPS and SCS-II Play Duration[a] Comparison

Data Source	Mean Play Duration (minutes/day)			X^2 test[b]
	Cold Weather	Warm Weather	Total	
NHAPS	114	109	223	$p<0.0001$
SCS-II	102	206	308	

[a] Selected previous day activities in NHAPS; average day outdoor play on bare dirt or mixed grass and dirt in SCS-II.
[b] 2x2 Chi-square test for contingency between NHAPS and SCS-II.

Source: Wong et al., 2000.

Table 16-43. NHAPS and SCS-II Hand Wash Frequency[a] Comparison

Data Source	Season	Percent[b] Reporting Frequency (times/day) of:								X^2 test[c]
		0	1-2	3-5	6-9	10-19	20-29	30+	"Don't Know"	
NHAPS	Cold	3	18	51	17	7	1	1	3	
SCS-II	Cold	1	16	50	11	7	1	0	15	$p = 0.06$
NHAPS	Warm	3	18	51	15	7	2	1	4	
SCS-II	Warm	0	12	46	16	10	1	0	13	$p = 0.001$

[a] Selected previous day activities in NHAPS; average day outdoor play on bare dirt or mixed grass and dirt in SCS-II.
[b] Results are reported as percentage of total for clarity. Incidence data were used in statistical tests.
[c] 2x2 Chi-square test for contingency between NHAPS and SCS-II.

Source: Wong et al., 2000.

Table 16-44. Time Spent (minutes/day) Outdoors
Based on CHAD Data (Doers Only)[a]

Age Group	N	Time Spent Outdoors					COV(%)	Participation[b] (%)
		Minimum	Median	Maximum	Mean	SD		
<1 month	57	2	60	700	99	124	125	47
1 to 2 months	5	4	60	225	102	90	89	36
3 to 5 months	27	10	90	510	114	98	86	23
6 to 11 months	91	5	60	450	91	76	84	33
1 year	389	1	75	1,035	102	99	97	58
2 years	448	1	100	550	134	108	80	64
3 to 5 years	1,336	1	120	972	146	117	80	68
6 to 10 years	2,216	1	120	1,440	162	144	89	71
11 to 15 years	1,423	1	110	1,440	154	163	106	73
16 to 17 years	356	1	85	1,083	129	145	112	81
18 to 20 years	351	1	70	788	132	155	118	72

[a] Only data for individuals that spent >0 time outdoors and had 30 or more records are included in the analysis.
[b] Participation rates or percent of sample days in the study spending some time (>0 minutes per day) outdoors. The mean time spent outdoors for the age group may be obtained by multiplying the participation rate by the mean time shown above.
SD = Standard deviation.
COV = Coefficient of variation (SD/mean x 100).

Source: Graham and McCurdy, 2004.

Table 16-45. Comparison of Daily Time Spent Outdoors (minutes/day), Considering Gender and Age Cohort (Doers Only)[a]

Age Group	Gender	N	Time Spent Outdoors in Minutes					COV (%)	K-S Test[b]			
			Minimum	Median	Maximum	Mean	SD		Dn	χ^2	ρ	Reject H_0
< 1 month	Male	35	7	68	700	116	144	125	0.24	0.90	0.3964	No
	Female	22	2	58	333	73	78	106	-	-	-	-
1 to 2 months	Male	4	4	58	165	71	68	95	Cannot Test			
	Female	1	225	225	225	225	-	0				
3 to 5 months	Male	20	10	86	210	89	56	63	0.42	0.96	0.3158	No
	Female	7	50	140	510	187	153	81				
6 to 11 months	Male	53	10	60	450	95	83	87	0.07	1.00	0.3200	No
	Female	38	5	68	270	86	67	77				
1 year	Male	184	1	80	1,035	110	114	104	0.07	0.71	0.6896	No
	Female	205	4	70	511	95	82	86				
2 years	Male	232	1	105	550	136	105	77	0.09	1.00	0.2705	No
	Female	216	2	90	525	131	111	84				
3 to 5 years	Male	723	1	120	972	146	119	81	0.04	0.74	0.6465	No
	Female	612	2	120	701	144	113	78				
6 to 10 years	Male	1228	1	132	1,440	173	148	86	0.09	2.05	0.0004	Yes
	Female	987	2	115	1,380	148	138	93				
11 to 15 years	Male	779	1	125	1,440	171	169	99	0.17	3.12	< 0.0001	Yes
	Female	640	1	90	1,371	134	153	114				
16 to 17 years	Male	168	2	113	810	151	147	97	0.19	1.80	0.0030	Yes
	Female	188	1	68	1,083	109	141	129				
18 to 20 years	Male	184	2	95	788	162	176	109	0.20	1.84	0.0023	Yes
	Female	167	1	50	606	99	119	120				

[a] Only data for individuals that spent >0 time outdoors and had 30 or more records are included in the analysis.
[b] The two-sample Kolmogorov-Smirnov (K-S) test H_0 is that the distribution of variable 1 is the same as variable 2, using a $\chi 2$ test statistic at $\propto$=0.050.
SD = Standard deviation.
COV = Coefficient of variation (SD/mean x 100).

Source: Graham and McCurdy, 2004.

Table 16-46. Time Spent (minutes/day) Indoors
Based on CHAD Data (Doers Only)[a]

Age Group	N	Time Spent Indoors					COV(%)	Participation[b] (%)
		Minimum	Median	Maximum	Mean	SD		
<1 month	121	490	1,380	1,440	1,336	137	10	100.0
1 to 2 months	14	1,125	1,380	1,440	1,348	105	8	100.0
3 to 5 months	115	840	1,385	1,440	1,359	93	7	100.0
6 to 11 months	278	840	1,370	1,440	1,353	81	6	100.0
1 year	668	315	1,350	1,440	1,324	107	8	100.0
2 years	700	290	1,319	1,440	1,286	138	11	100.0
3 to 5 years	1,977	23	1,307	1,440	1,276	136	11	100.0
6 to 10 years	3,118	7	1,292	1,440	1,256	153	12	100.0
11 to 15 years	1,939	69	1,300	1,440	1,255	160	13	99.8
16 to 17 years	438	161	1,296	1,440	1,251	171	14	100.0
18 to 20 years	485	512	1,310	1,440	1,242	180	15	100.0

[a] Only data for individuals that spent >0 time indoors and had 30 or more records are included in the analysis.
[b] Participation rates or percent of sample days in the study spending some time (>0 minutes per day) indoors. The mean time spent indoors for the age group may be obtained by multiplying the participation rate (as a decimal) by the mean time shown above.
N = Sample size.
SD = Standard deviation.
COV = Coefficient of variation (SD/mean x 100).

Source: Graham and McCurdy, 2004.

Table 16-47. Time Spent (minutes/day) in Motor Vehicles
Based on CHAD Data (Doers Only)[a]

Age Group	N	Time Spent in Motor Vehiicles					COV(%)	Participation[b] (%)
		Minimum	Median	Maximum	Mean	SD		
<1 month	80	2	68	350	86	68	79	66
1 to 2 months	9	20	83	105	67	32	48	64
3 to 5 months	75	13	60	335	71	49	69	65
6 to 11 months	226	4	51	425	62	47	76	81
1 year	515	1	52	300	67	50	76	77
2 years	581	2	54	955	73	76	104	83
3 to 5 years	1,702	1	55	1,389	70	70	99	86
6 to 10 years	2,766	1	58	1,214	71	68	95	89
11 to 15 years	1,685	1	60	825	76	74	97	87
16 to 17 years	400	4	73	1,007	92	90	98	91
18 to 20 years	449	4	76	852	109	106	98	93

[a] Only data for individuals that spent >0 time in motor vehicles and had 30 or more records are included in the analysis.
[b] Participation rates or percent of sample days in the study spending some time (>0 minutes per day) in motor vehicles. The mean time spent in motor vehicles for the age group may be obtained by multiplying the participation rate (as a decimal) by the mean time shown above.
N = Sample size.
SD = Standard deviation.
COV = Coefficient of variation (SD/mean x 100).

Source: Graham and McCurdy, 2004.

Table 16-48. Time Spent (minutes/two-day period)[a] in Various Activities by Children Participating in the Panel Study of Income Dynamics (PSID), 1997 Child Development Supplement (CDS)

Age Group	Boys (N = 1,444)		Girls (N = 1,387)	
	Mean[a]	Standard Deviation	Mean[a]	Standard Deviation
Television Use				
1 to 5 years	197	168	184	163
6 to 8 years	263	165	239	159
9 to 12 years	251	185	266	194
Electronic Game Use				
1 to 5 years	8	38	5	40
6 to 8 years	44	113	14	39
9 to 12 years	57	102	18	47
Computer Use				
1 to 5 years	7	28	7	35
6 to 8 years	13	43	8	28
9 to 12 years	27	71	15	43
Print Use[b]				
1 to 5 years	21	32	23	34
6 to 8 years	20	37	20	32
9 to 12 years	19	47	29	56
Highly Active Activities[c]				
1 to 5 years	42	74	34	78
6 to 8 years	107	123	62	92
9 to 12 years	137	149	63	88
Moderately Active Activities[d]				
1 to 5 years	55	81	59	92
6 to 8 years	31	65	37	69
9 to 12 years	40	73	46	89
Sedentary Activities[e]				
1 to 5 years	55	71	54	71
6 to 8 years	75	77	80	84
9 to 12 years	110	109	122	111

[a] Means represent minutes spent in each activity over a 2-day period (one weekday and one weekend day).

[b] Print use represents time spent using print media including reading and being read to.

[c] Includes all sport activities such as basketball, soccer, swimming, running or bicycling.

[d] Includes activities such as singing, camping, taking music lessons, fishing, and boating.

[e] Includes activities such as playing board games, doing puzzles, talking on the phone, and relaxing.

N = Sample size.

Source: Vanderwater et al., 2004.

Table 16-49. Mean Time Spent (minutes/day) in Various Activity Categories, by Age - Weekday

Activity Category	2002-2003				1981-1982			
	6 to 8 years	9 to 11 years	12 to 14 years	15 to 17 years	6 to 8 years	9 to 11 years	12 to 14 years	15 to 17 years
Market work	0	0	1	22	-	-	-	28
Household work	25	32	38	39	15	18	27	34
Personal care	68	66	68	73	49	40	56	60
Eating	60	57	54	49	81	73	69	67
Sleeping, naps	607	583	542	515	595	548	473	499
School	406	398	395	352	292	315	344	314
Studying	29	39	49	50	8	29	33	33
Church	4	5	5	3	9	9	9	3
Visiting, socializing	16	25	25	53	-	-	-	-
Sports	10	17	33	33	24	21	40	46
Outdoor Activities	6	6	4	6	9	8	7	11
Hobbies	1	1	1	2	2	2	4	6
Art Activities	8	7	7	4	4	3	3	12
Television	94	106	111	115	99	146	142	108
Other passive leisure	9	10	24	39	-	-	-	-
Playing	74	56	45	35	111	65	31	14
Reading	11	12	11	7	5	9	10	12
Being read to	2	1	0	0	-	-	-	-
Computer activities	6	10	25	38	-	-	-	-
Missing data	4	8	4	6	-	-	-	-

- = Data not provided.

Source: Juster et al., 2004.

Table 16-50. Mean Time Spent (minutes/day) in Various Activity Categories, by Age - Weekend Day

Activity Category	2002-2003				1981-1982			
	6 to 8 years	9 to 11 years	12 to 14 years	15 to 17 years	6 to 8 years	9 to 11 years	12 to 14 years	15 to 17 years
Market work	0	0	9	39	-	-	-	48
Household work	81	91	100	79	27	51	72	60
Personal care	78	72	73	77	45	44	60	51
Eating	89	80	69	64	80	78	68	65
Sleeping, naps	666	644	633	629	641	596	604	562
School	3	6	7	7	-	-	-	-
Studying	5	9	20	24	2	12	15	30
Church	41	37	36	30	56	53	32	37
Visiting, socializing	61	66	58	91	-	-	-	-
Sports	23	40	40	27	30	42	51	37
Outdoor Activities	12	12	12	11	23	39	25	26
Hobbies	2	1	4	5	5	3	8	3
Art Activities	11	7	9	6	4	4	7	10
Television	155	184	181	162	136	185	169	157
Other passive leisure	14	15	40	54	-	-	-	-
Playing	163	134	148	59	180	92	35	21
Reading	14	15	13	7	9	10	10	18
Being read to	1	1	0	0	-	-	-	-
Computer activities	12	19	39	58	-	-	-	-
Missing data	9	8	9	11	-	-	-	-

- = Data not provided.

Source: Juster et al., 2004.

Table 16-51. Mean Time Spent (minutes/week) in Various Activity Categories for Children, Ages 6 to 17 Years

Activity Category	2002-2003	1981-1982
Market work	53	126
Household work	343	223
Personal care	493	356
Eating	426	508
Sleeping, naps	4,092	3,758
School	1,947	1,581
Studying	238	158
Church	94	125
Visiting, socializing	287	132
Sports	179	244
Outdoor Activities	50	100
Hobbies	12	27
Art Activities	48	40
Television	876	944
Other passive leisure	166	39
Playing	485	440
Reading	77	69
Being read to	5	3
Computer activities	165	0
Missing data	45	1,206

Source: Juster et al., 2004.

Table 16-52. Mean Time Use (hours/day) by Children, Ages 15 to 19 Years

Activity	hours/day		
	Male	Female	All
Personal Care[a]	10.26	10.34	10.30
Eating and Drinking[b]	1.02	1.11	1.07
Household Activities[c]	0.61	0.92	0.76
Purchasing Goods and Services[d]	0.38	0.74	0.56
Caring for and Helping Household Members[e]	0.10	0.19	0.15
Caring for and Helping Non-Household Members[f]	0.20	0.23	0.21
Working on Work-related Activities[g]	1.53	1.24	1.39
Educational Activities[h]	3.08	3.51	3.29
Organizational Civic and Religious Activities[i]	0.34	0.33	0.34
Leisure and Sports[j]	6.02	4.75	5.40
total leisure and sports - weekdays	-	-	4.85
total leisure and sports - weekends	-	-	6.68
sports, exercise, recreation - weekdays	-	-	0.58
sports, exercise, recreation - weekends/holidays	-	-	0.69
socializing and communicating - weekdays	-	-	0.76
socializing and communicating, - weekends/holidays	-	-	1.32
watching TV - weekdays	-	-	1.96
watching TV - weekends/holidays	-	-	2.45
reading - weekdays	-	-	0.11
reading - weekends/holidays	-	-	0.11
relaxing, thinking - weekdays	-	-	0.15
relaxing, thinking - weekends/holidays	-	-	0.13
playing games, computer use for leisure - weekdays	-	-	0.69
playing games, computer use for leisure - weekends/holidays	-	-	1.00
other sports/leisure including travel - weekdays	-	-	0.61
other sports/leisure including travel - weekends/holidays	-	-	0.98
Telephone Calls, Mail, and E-mail[k]	0.24	0.42	0.33
Other Activities not Elsewhere Classified[l]	0.23	0.21	0.22

[a] Includes sleeping, bathing, dressing, health-related self care, and personal and private activities.

[b] Includes time spent eating or drinking (except when identified as part of work or volunteer activity); does not include time spent purchasing meals, snacks, or beverages.

[c] Includes housework, cooking, yard care, pet care, vehicle maintenance and repair, home maintenance, repair, decoration, and renovation.

[d] Includes purchase of consumer goods, professional (e.g., banking, legal, medical, real estate) and personal care services (e.g., hair salons, barbershops, day spas, tanning salons), household services (e.g., housecleaning, lawn care and landscaping, pet care, dry cleaning, vehicle maintenance, construction), and government services (e.g., applying for food stamps, government required licenses or paying fines).

[e] Includes time spent caring or helping to care for child or adult household member (e.g., physical care, playing with children, reading to child or adult, attending to health care needs, dropping off, picking up or waiting for children).

[f] Includes time spent caring or helping to care for child or adult who is not a household member (e.g., physical care, playing with children, reading to child or adult, attending to health care needs, dropping off, picking up or waiting for children). Does not include activities done through a volunteer organization.

[g] Includes time spent as part of the job, income-generating activities, or job search activities. Also includes travel time for work-related activities.

[h] Includes taking classes, doing research and homework, registering for classes, and before and after school extra-curricular activities, except sports.

[i] Includes time spent volunteering for or through civic obligations (e.g., jury duty, voting, attending town hall meetings), or through participating in religious or spiritual activities (e.g., church choir, youth groups, praying).

[j] Includes sports, exercise, and recreation. This category is broken down into subcategories for the 15 to 19 years old age category.

[k] Includes telephone use, mail and e-mail. Does not include communications related to purchase of goods and services or those related to work or volunteering.

[l] Includes residual activities that could not be coded or where information was missing.

Source: U.S. DL, 2007.

Table 16-53. Mean Time Spent (minutes/day) in Moderate-to-Vigorous Physical Activity

Age (years)	Weekday Mean (SD)			Weekend Mean (SD)		
	Boys	Girls	Both	Boys	Girls	Both
9	190.8(53.2)	173.3(46.4)	181.8(50.6)	184.3(68.6)	173.3(64.3)	178.6(66.6)
11	133.0(42.9)	115.6(36.3)	124.1(40.6)	127.1(59.5)	112.6(53.2)	119.7(56.8)
12	105.3(40.2)	86.0(32.5)	95.6(37.8)	93.4(55.3)	73.9(45.8)	83.6(51.7)
15	58.2(31.8)	38.7(23.6)	49.2(29.9)	43.2(38.0)	25.5(23.3)	35.1(33.3)

SD = Standard deviation.

Source: Nader et al. 2008.